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SOME CONSIDERATIONS OF THE EMBRYOLOGY, ANATOMY AND PATHOLOGY OF THE PROSTATE.*

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Nicola Massa, a Venetian physician who died in 1563, was probably the first practitioner to call attention to the hypertrophied prostate. There have been many methods of treating this condition—injection of iodine and ergotine into the substance of the gland, tunnelling through the gland, supra-

Fig. 1.—Dissection designed to show the prostatic sheath and aponeurosis of Denonvilliers.

pubic and perineal puncture, the use of the galvano-caustic incision, and finally prostatectomy.

Of the two routes for prostatectomy, the perineal was first taken up by Harrison in 1881, Ashurst 1882, Annandale 1888, Murphy 1902, Young 1903. The suprapubic method has in recent years become the more popular surgical operation.

Embryology and Anatomy. It should be remembered that the genito-urinary duct is developed from three main sources:

First, the Wollfian bodies and ducts;

Second, the Müllerian ducts;

Third, the allantois.

The prostate gland is first recognized in the third month of fetal life as a thickening in the posterior wall of the urethra. The two lobes remain distinct until the fifth month, when they coalesce around the urethra. In rare instances the urethra has been found in the adult to merely groove the anterior surface of the prostate and not to be completely encircled by it. In about 1805 John Hunter and Sir Everard Home described the third lobe. This entity, however, does not seem to be sustained by embryological facts. There is a bursa of peritoneal sac shut off between the prostate anteriorly and the rectum posteriorly known as the fascia or

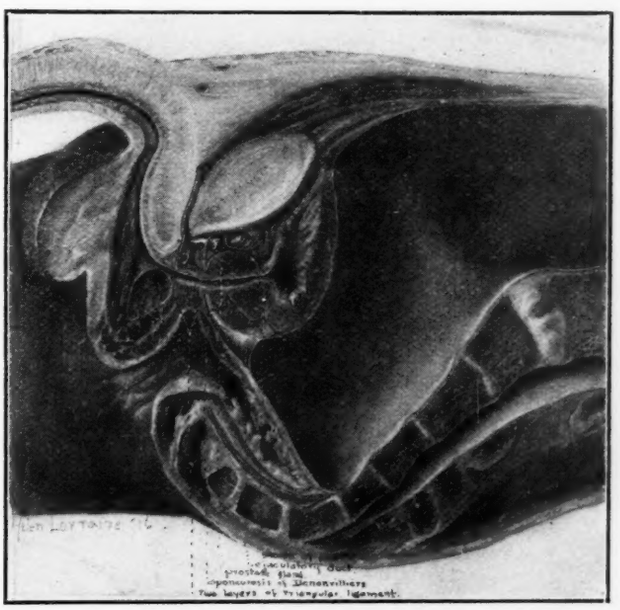

Fig. 2.—A sagittal section of the male pelvis showing the relations of the prostate and the fascia of Denonvilliers.

aponeurosis of Denonvilliers, something like the tunica vaginalis testis, which, although in the adult it is separable into two layers, is lined with serous tissue but no longer discloses a distinct cavity.

The prostate is about the size of a horse chestnut and weighs 15 to 24 grams. It consists of glandular acini and ducts lined with cubical epithelium embedded in involuntary muscles, and well supported by fibrous tissues which constitute the stroma of the organ. Some voluntary muscle fibers are found in the anterior commissure; the involuntary muscle fibers about the urethra are continuous with the circular fibers of the bladder. This stroma is continued peripherally and forms the capsule of the gland, which is separate and distinct from the sheath, which latter is formed by the pelvic fascia. The prostate gland in its development coalesces from behind forward, so that the depth of the

*Read before the Richmond Surgical Society May 1, 1917.

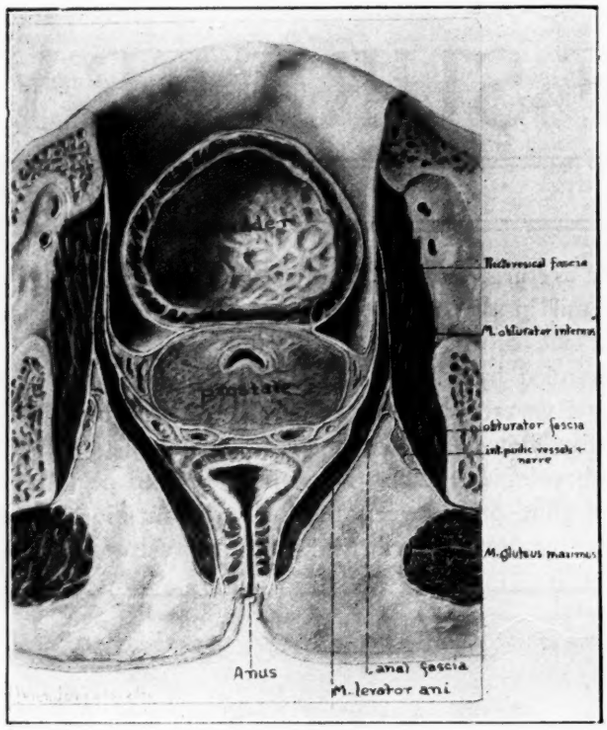

Fig. 3.—Showing the recto-vesical fascia, its envelopment of the prostate and the plexus of Santorini.

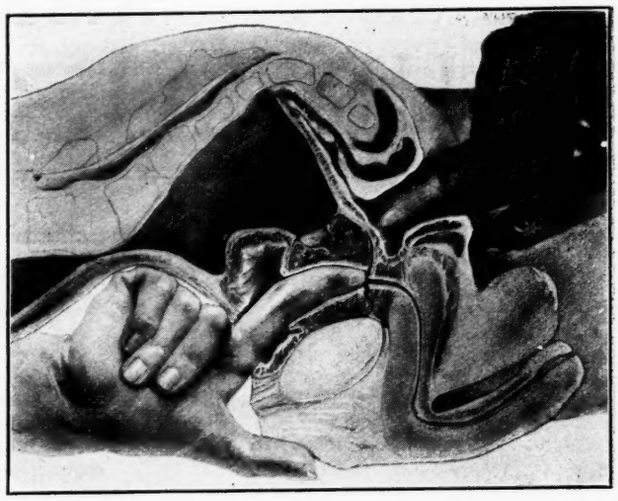

Fig. 5.—The intra-urethral enucleation: finger thrust through the urethra to the posterior layer of the cut-off muscle.

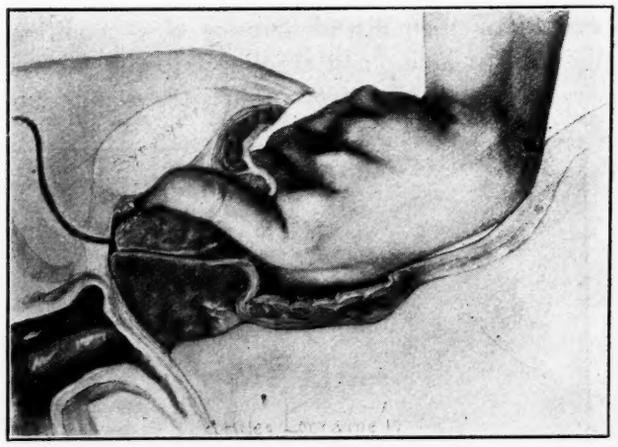

Fig. 6.—The finger seeks the line of cleavage between the sheath and the capsule, and enucleation is carried out from before backwards.

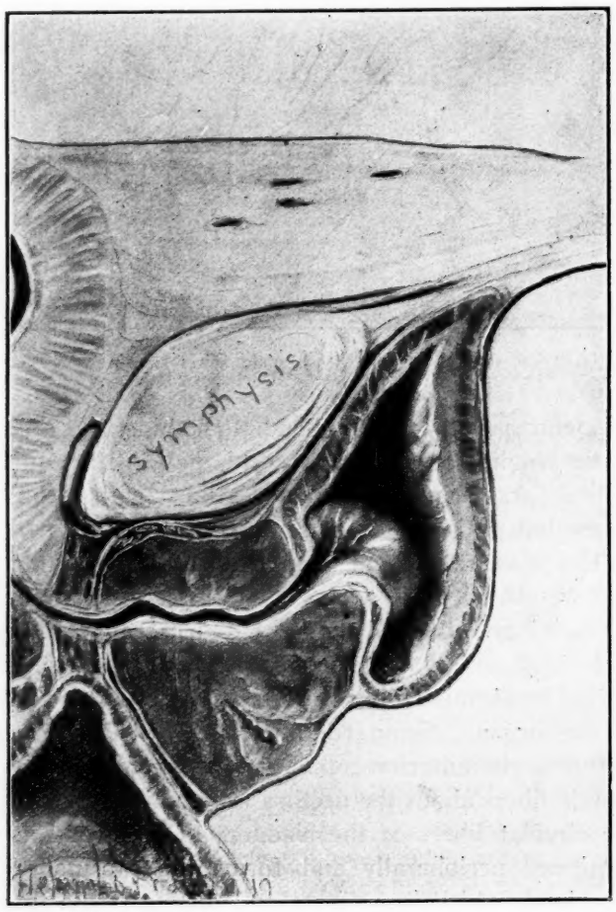

Fig. 4.—The intravesical projection of prostatic hypertrophy.

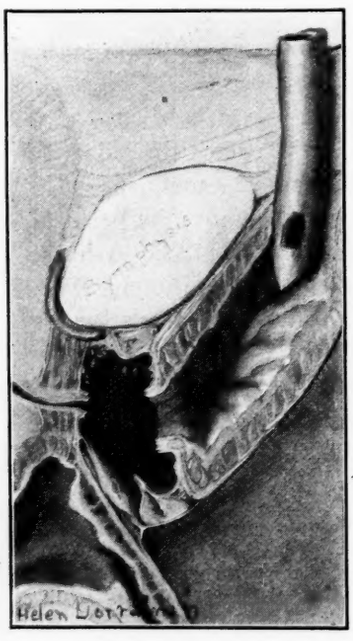

Fig. 7.—The prostatic cavity, showing the lacerated plexus of veins.

Fig. 8.—Drawing of dissection with prostate removed showing the remaining sheath and plexus of Santorini.

urethra in the substance of the gland is dependent upon the extent of the growth. In the majority of instances about one-third of the organ is in front and two-thirds posteriorly. The pelvic fascia lines the entire side of the levator ani muscle and swings as a hammock from the pubic symphysis anteriorly to the spine of the ischium porteriorly. This forms the sheath of the prostate, between which and the capsule proper is found the plexus of Santorini, which at times is highly developed.

It may be appropriate here to take up the special division of the pelvic fascia, showing its superior,

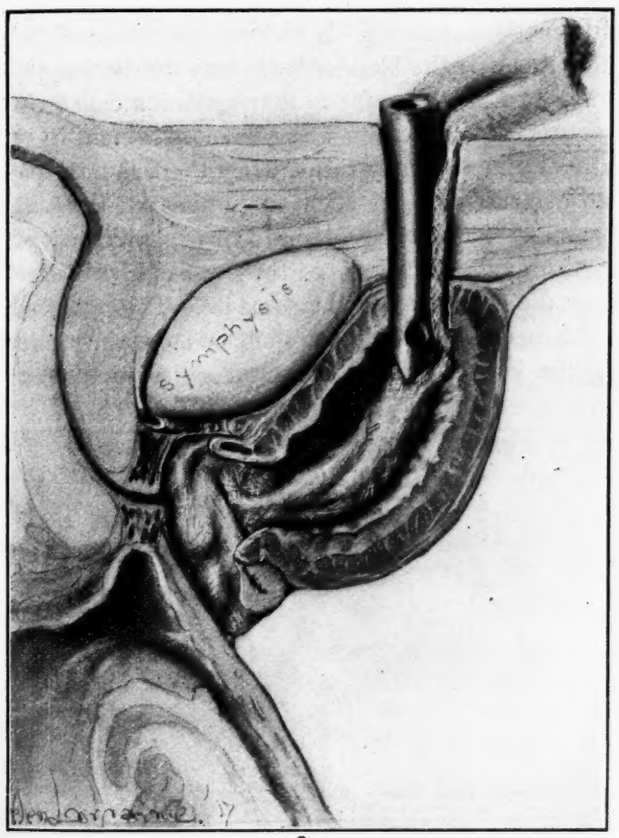

Fig. 9.—Gauze packed into the prostatic bed to prevent hemorrhage, and brought out alongside the suprapubic drain.

middle and inferior layers. Suffice it to say that between the capsule of the prostate and the sheath there are various fibrous prolongations which possibly serve as a medium of support and have been dignified by the name of pubo-prostatic ligaments and the levator prostate, which is superior to the deep layer of the triangular ligament. These facial bands become well organized, particularly in periprostatitis and prostatitis, so that in the operation of enucleation much force is required at times, so much so that if the line of cleavage is not definitely determined considerable hemorrhage from the lacerated venous plexus is the result. It must be recalled that the plexus of Santorini lies within the meshes of the sheath of the prostate and entirely outside of the capsule. These veins travel from before backward along the antero-lateral aspect of the prostate, and, although they have a large number of valves, at times become much engorged and varicosed as they run posteriorly to empty into the internal iliac veins, and consequently are subject to phlebolith formation. The uvula vesicae is caused by the reduplication of the involuntary muscle fibers just under the mucous membrane, and these fibres are continuous with the internal sphincter muscular bundles, the connective tissue about the utricle being the homologue of the broad ligament. The normal shape of the prostatic uretha is fusiform. Hyperplasia of the muscular tissue or connective tissue may cause a pathological state simulating prostatic hypertrophy, or contracture of the neck of the bladder.

The prostate must be considered as a compound

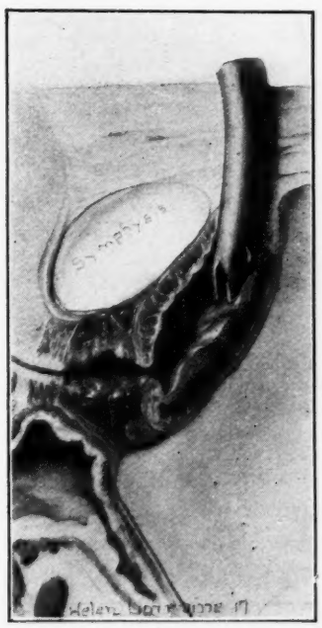

Fig. 10.—The prostatic cavity granulating one week after operation.

tubular gland, and this tissue is most marked in the two lateral lobes of the prostate, and is less in evidence superiorly. The glands and ducts converge towards the urethra. It should be borne in mind that the muscular tissue of the prostate, as brought out by Griffith and Hodson, is a continuation of the circular layer of the bladder, which is longitudinal in direction and ceases at the urethral orifice. Accordingly, the ducts of the prostate are found to be devoid of a special muscular development, whereas the acini have a layer of involuntary muscles lining them throughout their extent.

Pathology. Apparently there are two types of overgrowth of the prostate: first, the soft glandular prostate, and, second, the hard fibrous prostate.

The former grows rapidly and the latter slowly. In an adenomatous overgrowth the tumor is characterized by overgrowth of the glandular acini without increase of the number of the corresponding ducts. The compression peripherally by these tumors may be so marked that in time the stroma surrounding this localized glandular overgrowth begins to grow, compressing the acini so that the prostatic tumor formerly almost wholly glandular in character becomes ultimately fibrous and solid. The tubules may be very closely packed together, at

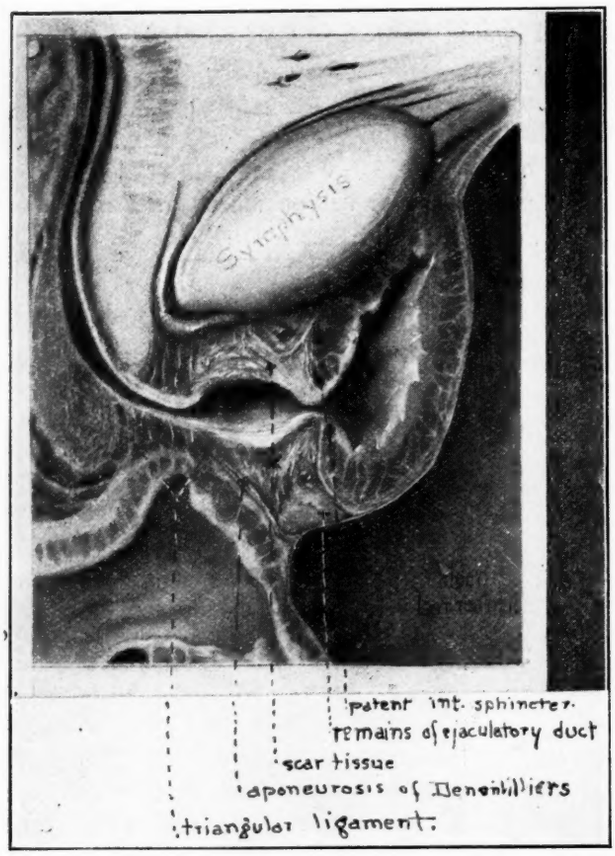

Fig. 11.—Drawing of theoretical result one month after prostatectomy. Note the tone of the internal sphincter.

times inverted from the pressure. The stroma surrounding the ducts and that about the acini show fibroblasts, and here and there may be seen fully formed connective tissues. This further tends to retention cysts, with prospective and possible stone formation. At times a tubule may burst through the capsule and become adherent to the sheath, with the probability of future hypertrophy after an apparently complete prostatectomy; this accounts for the recurrences after the supra-pubic operation.

What formerly was considered as muscular tissue is now known as fibroblasts. It is with such a condition of affairs that Albarran's group of subcervical glands, the accessory prostatic glands, may become involved, more or less blocking the urethra, in which there are no palpable evidences of enlarged prostate by rectal examination. Moulin has shown that with prostatic obstruction the floor of the bladder is the part of the reservoir which is the last to be emptied. It is the first to dilate, the effort of the bladder to evacuate itself only serves to press the urine against the floor of the bladder and to increase the capacity of the post-prostatic pouch.

If the lateral lobes enlarge uniformly they tend to spread away from the middle line and raise a fold of tissue as a ridge across the vesical orifice of the urethra. This may be composed of mucous membrane only, or have a varying amount of submucous tissue as well. It receives the name of "bar at the neck of the bladder." It may not be inappropriate just here to refer to that condition called contracture of the neck. Very great impairment of the urinary function may result when there is no apparent obstruction. In such cases the cause of the trouble is the existence of hard or organized edema, or of an anteriosclerosis at the neck of the bladder, or in the substance of the prostate. This condition is the result of a long-standing congestion, rendering the internal orifice firm and rigid, so that me-

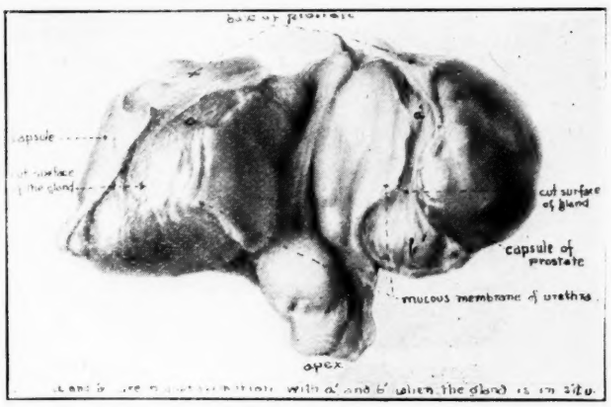

Fig. 12.—Hypertrophied prostate after removal.

chanical obstruction arises from an actual immobility and inelasticity of the parts. It is these instances, in which the prostate is not at all, or but slightly, enlarged, that furnish in the earlier stages an evidence of what is known as the hard or fibrous prostate; later there must be, with compensation, an hypertrophy of the wall. If the obstruction is not relieved replacement fibrosis starts up and the hard "cricket-ball bladder" is the result. The mechanical influence of the pubo-prostatis ligament cannot be disregarded—fixing the roof superiorly, thus inhibiting a sagging and alignment of the vesical outlet, cervical impediment is increased, so that if the conditions of contracture of the neck of the bladder, or elevation of the trigonal ridge,

are present an operation designed to relieve the condition of urinary calls and embarrassment is not benefited by prostatic enucleation. With the condition of retention dilation ensues, the ureteral mouths give way, hydroureter is inaugurated, flattening of the calyces of the kidney is developed, greater strain is put upon the heart, blood pressure is increased, and the vicious circle develops. To this condition of affairs may now be added infection, as the terminal pathological manifestation, with ropy mucus, which further blocks the urethral outlet, the veins turgid and swollen and the imperious calls frequent and distressing.

It has been stated that 25 per cent of all cases of hypertrophy of the prostate are cancerous. Prostatic hypertrophy is really an overgrowth of the acini without corresponding increase in the number of the ducts, with a more or less pronounced periacinar round cell infiltration. At times there are two or more layers of cells lining the acini, which simulates strongly cancerous nests. Fortunately cancer starts centrally, the peripheral fascia is dense, and the condition may be borne for a considerable length of time before it escapes into the surrounding structures. Diagnosis in the early stages is important, and early operation affords the only hope of recovery.

A FRENCH LITANY WORTH KNOWING.

A bit of French litany, a little philosophy of the French soldier is before me. It is headed:

"Nothing to Worry About."

"You have two alternatives: Either you are mobilized or you are not. If not, you have nothing to worry about.

"If you are, you have two alternatives: Either you are in camp or at the front. If you are in camp, you have nothing to worry about.

"If you are at the front, you have two alternatives: Either you are in reserve or you are on the fighting line. If you are in reserve, you have nothing to worry about.

"If you are on the fighting line, you have two alternatives: Either you scrap or you don't. If you don't you have nothing to worry about.

"If you do, you have two alternatives: Either you get hurt or you don't. If you don't, you have nothing to worry about.

"If you do, you have two alternatives: Either you get slightly hurt or you get badly hurt. If slightly, you have nothing to worry about.

"If badly, you have two alternatives: Either you recover or you don't. If you recover, you have nothing to worry about. If you don't and have followed my advice clear through, you have done with worry forever."

The name of the author of this philosophy does not appear. Perhaps some French soldier who had acquired the "happy habit" first put it into writing. Nevertheless, it is said that thousands of fighting Frenchmen now know it by heart and have made it their philosophy of army life.—The Silent Partner.—*Medical Insurance and Health Conservation.*

THE ROLE OF LOCAL AND REGIONAL ANESTHESIA IN SURGERY OF THE PROSTATE.*

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NEW YORK.

Our most recent experiences with surgery of the prostate gland lead us to believe that the all important thing is not the anesthetic or the type of operation but is the proper preparation of the patient before any procedure whatever is undertaken. The average person suffering from any disorder of the prostate, particularly on a public hospital service such as Dr. Osgood's and Dr. Keyes' at Bellevue, usually comes to us very late in the course of the disease. The preliminary step is to determine the renal power which the patient has at the time. This investigation is three-fold. First the 24 hour specimen is examined thoroughly to determine whether the full amounts of excretory products are being eliminated. A phenolsulphonephthalein test is then made to determine the functional activity of the renal epithelium. At the same time the blood is examined for non-protein nitrogen contents to decide whether there is retention or not. Thus we have three methods of arriving at a conclusion regarding the functional activity of the kidney.

Unless there is an incompetency of the heart or a disturbance of circulation of grave character, we are inclined to disregard cardiac affections.

The kidney activity is so frequently disturbed that it is almost universal to institute treatment preliminary to operation. This consists of one thing, viz., drainage. It may be accomplished well by means of an indwelling catheter if the patient tolerates it. Otherwise a suprapubic cystostomy may be performed. I prefer the indwelling catheter because it allows the patient to be up and about, which is a decided advantage. Acid sodium phosphate and hexamethylenamin are given as urinary antiseptics.

The choice of operation depends upon the type of obstruction. Changes in the prostate gland or other contiguous structures causing abnormality of greater or less degree at the vesical orifice, occur in sixty-one cases out of two hundred and twenty-four studied. Fourteen and seven-tenths per cent. of the entire number of specimens observed showed an enlargement of the subcervical group of tubules. Most of these occur after the thirtieth year, so that 22.8% of

* Read before the Section on Genito-Urinary Surgery, N. Y. Academy of Medicine, October 17, 1917.

the specimens older than this show such an abnormality. General enlargement of the prostate occurs in 11.1% of all the glands studied. There are three enlargements of the subcervical group. The usual subcervical group enlargement is unilobular. Occasionally the enlargement may be divided into three portions. There are two types of obstruction with intravesical projection at the posterior portion of the neck of the bladder. The most common is an enlargement of the subcervical group with projection from within the sphincter. The second type is an enlargement of the middle lobe proper which develops outside the sphincter and projects into the bladder by lifting the trigonum vesicae.

All of the methods utilized in the surgical treatment of tumors of the subcervical group may be performed under local anesthesia. The usual method is to empty the bladder, then instil one ounce of novocaine 4% into the posterior urethra and inject the anterior urethra as well. Fully twenty minutes should be given this drug in which to act thoroughly. Dr. Barringer has introduced a new method recently, viz., direct injection of the anesthetic into various parts of the prostate by means of a needle projected though the perineum and guided by a finger in the rectum. This method I have found to be very effective.

Numerous procedures have been recommended. I have found Young's punch operation to be decidedly the best method employed in removing these intra-sphincteric masses, be they small, large, unilobular, or trilobular. The instrument is introduced so that the fenestra is in the posterior urethra. The obturator is withdrawn and the instrument inserted still further until the tumor at the vesical orifice rises into the fenestra, completely filling it. The cutting inner tube is then introduced and quickly pushed into position, punching out the entire portion of the tumor in the fenestra. The instrument is then turned obliquely to the right, then to the left, where the procedure is repeated. The instrument is then withdrawn and a catheter with a large fenestra introduced. It is wise to keep a small amount of fluid in the bladder continually, but the former practice of keeping up continuous irrigations has been given up as it seems to delay the clotting of the blood and delays healing. As a rule the bleeding stops after a few hours, and the catheter can often be removed after twenty-four or thirty-six hours.

Bugbee, McCarthy and Stevens have treated these tumors by burning a groove through them with a high frequency current and in some cases it is to be recommended. Fibrous stricture at the vesical orifice may be treated by the Chetwood galvano-cautery under local or spinal anesthesia. Local anesthesia plays a very important rôle in benign hypertrophy of the prostate. Formerly spinal anesthesia was practiced very frequently, especially by Hugh Cabot of Boston and E. L. Keyes of New York. The technique of its employment is as follows:

The patient is seated upon the operating table with back bent forward, a spinal needle is introduced into the spinal canal and a few cc. of the spinal fluid withdrawn into a Record syringe which already contains 1 cc. of 5% tropococaine, or whatever anesthetic is to be used. This is injected. The patient is then laid upon his back with head elevated for a few minutes and then raised to a semi-reclining position. Within five or ten minutes the patient notices a tingling sensation of the lower extremities and the operation may be begun. Position is extremely important in the use of spinal anesthesia. Unless the patient is placed in a semi-reclining position the anesthesia may travel to the medulla and result fatally. This accounts for the inadvisability of perineal operations under spinal anesthesia.

The utilization of spinal anesthesia in surgery of the prostate has become very limited on account of the fact that the mortality of the procedure became excessive and on account of perfection of other methods.

It is my practice to perform Young's perineal prostatectomy in every case unless it is contraindicated by some particular feature. These contraindications are: (1) Inability of the patient to take gas-and-oxygen anesthesia because this operation cannot under ordinary circumstances be done under local or spinal anesthesia; (2) the presence of a marked enlargement of the subcervical group of tubules; (3) the presence of a stone too large to be removed through the perineum. Our method on the service at Bellevue Hospital in any suprapubic prostatectomy is to infiltrate the skin with 0.2% cocaine. A 3-inch incision is made in the midline commencing just above the symphysis pubis. It is deepened through the subcutaneous fat, superficial, and deep fasciae, and rectus abdominalis, and pyramidalis muscles, under the influence of 0.1% cocaine. Then a lateral incision is made in the prevesical fascia at a low point under the same drug and the fascia and prevesical fat as well

as any reflection of the peritoneum are peeled back exposing the bladder which has previously been distended with fluid. The bladder wall is then infiltrated with cocaine and an incision long enough to admit two fingers is made into the bladder, the edges being caught with two clamps.

Then gas-oxygen anesthesia is instituted for the actual enucleation of the prostate by the intraurethral method usually inserting two fingers in the rectum to aid in the manipulation. At the completion of the enucleation the anesthetic is discontinued and if the bleeding is not marked the bladder is closed with a large Marion tube fixed at the highest point of the incision. If the bleeding is profuse the patient is put into the Trendelenburg position, the bladder retracted and the bleeding points clamped and ligated just as they would be in an operation on any other part of the body. The entire closure is done without the use of gas and oxygen because the local anesthetic previously infiltrated is still effectual in preventing sensation in the tissues to be sutured.

I wish to mention in a preliminary way a modification of the procedure. In a small series of cases that I have recently operated upon I have placed the patient in a lithotomy position. The suprapubic operation is then performed in the manner described. While the patient is yet under the gas-oxygen anesthesia a median perineal incision is made into the membranous urethra and a perineal tube sutured into place. The bladder is then closed up tight above, the entire drainage taking place through the perineal tube, suction being used by means of the vacuum bottle system devised by Caples. I shall give a more extended report upon this method as soon as I have a sufficiently large series.

The reason why we do not attempt the enucleation under local anesthesia is that the gas and oxygen so little disturbs the kidney function that it has not seemed worth while causing the patient the pain which would result from the rather vigorous exercise coincident with the actual removal of the gland.

Complete prostatectomy in early carcinoma by Young's method is not feasible under local or spinal anesthesia.

One of three methods may be followed to relieve retention of carcinoma, the operation of choice to be determined by the nature of the case. If only a portion of the prostate is involved the gland may be removed by the suprapubic method. If the entire prostate is carcinomatous and instrumentation is not too difficult a Young's punch operation may be performed under local anesthesia. If there is complete retention and instrumentation is painful and difficult a suprapubic cystotomy under local anesthesia is indicated.

THE ROENTGEN RAY EXAMINATION OF FRACTURES.*

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The Roentgen Ray examination of fractures is a method of diagnosis so thoroughly established and so universally employed that any consideration of it would appear to be entirely superfluous, for it would seem as if nothing new or striking could be advanced.

It is, however, important that we pause occasionally to review this subject, to estimate the actual value of its contribution, to establish its limitations, its advantages and disadvantages over the clinical methods; in other words, to determine what has been the actual gain to surgery from the utilization of this method.

The groundless conflict between laboratory and clinical methods has been extended to this form of examination, for there are unfortunately still some who do not cease bewailing the abandonment of the so-called clinical methods for the newer method, which they describe as being inaccurate, misleading and not essential for the proper diagnosis and therapy. This attitude, however, is as untenable as the stand of those who prate of the uselessness of the clinical methods and urge their abandonment in favor of the simpler, harmless and more accurate Roentgen Ray examination. A little consideration will show that these two methods are not antagonistic but are interdependent and sustain and srengthen each other.

Roentgenology unquestionably has amplified our knowledge by permitting us to classify more accurately and identify the results of trauma. But it must be admitted that the greatest contribution which Roentgenology has made to the study of fractures has been that it has, by correcting the errors and strengthening the weak points of the clinical method, sharpened our clinical sense. It has improved our diagnostic ability and by thus acting as a check and a corrective factor to the clinical examination, the latter has

*Lecture delivered to the Medical Reserve Officers at Bellevue Hospital, New York City.

been intrenched more firmly than ever as an indispensable diagnostic method which is always available.

Radiography has given us a mental concept of a fracture, such as former generations did not and could not possess. With the advent of war, the study of traumatic injuries gains in importance. The main characteristics which these fractures possess are multiplicity, comminution, the association of foreign bodies and the complications of inflammation. The methods of Roentgen examination which are used in the study of fractures are as follows:

Methods of Roentgen Examination of Fractures.

1. Transillumination—roentgenoscopy.
   (a) General
2. Photograhic method—roentgenography
   (a) General examination
      Single plate target—plate distance 25-30 inches.
         Centric
            or
         Excentric
   (b) Special examination
      (1) Stereoroentgenography—two plates made with deviation of tube 2½ inches, the relation of plate to part remaining unchanged.

1. Fluoroscopic examination.

Roentgenoscopy, or examination by means of the fluorescent screen, is one of the important methods in the diagnosis of fractures. Because of the simplicity and small cost it has become an essential part of the equipment for diagnostic work.

The plate examination is comparatively far more complicated than the fluoroscopic method and requires numerous accessory appliances and, though it has the advantage of permanency and greater accuracy of its records, nevertheless, the simplicity, convenience and rapidity in obtaining results make the fluoroscope an instrument of greater general utility.

The requisites of safe and successful fluoroscopy are: 1, a ray of proper quantity and quality; 2, a screen of proper quality, size and suspension; 3, the proper sensitization of the eye; 4, the protection from deleterious effects. Careful attention to the first three requisites will contribute in a large measure to the establishment of the fourth.

Generally speaking, the horizontal fluoroscope is of greater utility in the examination of fractures than the vertical. The stative, whether horizontal or vertical, should be of such construction as to permit the maximum mobility of tube, patient, and screen. This means independence of screen movement from tube movement.

The *x*-ray tube should be completely enclosed in a box lined with lead, the container being more heavily covered over the active hemisphere. The tube box should be equipped with an iris or a slit diaphragm or both, the latter being of greater utility. Means of cooling the tube should be provided; a fan is usually sufficient. The opening of the box should be at least five by five inches and covered by a sheet of aluminum one millimeter thick. The box is to be suspended by counterweights and is to be freely movable in all directions by a single handle which should also contain the handles for the diaphragm and be long enough to bring the hand of the operator moving the tube completely out of range of the most divergent ray. The tube box should hang on a device which makes it part of a lead partition, moving behind another immovable lead partition, containing a large fiber window against which the patient rests. In this way a double lead partition with an intervening air space is provided. The distance of the target of the tube from the patient should not be less than twelve inches.

The horizontal apparatus should be a canvas or fiber topped table, under which the lead-lined box, containing the tube, moves freely in all directions. Means should be provided for keeping the canvas taut. The sides of the table should be covered with leaded rubber curtains.

With the vertical scope the screen is to be suspended independently by counterweights and should be of such weight and suspension as to hang closely and firmly against the patient without pressure. The screen should furnish a maximum illumination with a minimum amount of current, proper contrast, have freedom from lag and permanence of coating, be placed in an airproof mounting and be covered with lead glass one-sixth of an inch thick. It is an advantage, also, to have an arrangement on the back of the screen whereby the plate holder may be clamped in any position for the purpose of making an exposure during fluoroscopy. Means should be provided for easy and rapid tracing of the fluoroscopic image, as drawn on the lead glass, on tracing paper attached to the screen holder. With the vertical apparatus a fourteen by seventeen-inch screen should be used in all in-

stances, when possible, for even though the entire screen is rarely illuminated during fluoroscopy, it nevertheless offers a certain amount of protection to the operator. From the lower edge of the frame of the screen an apron of lead rubber at least eghteen inches long and as wide as the screen should be suspended. Several cuts in this will permit the use of the palpation spoons. With the horizontal apparatus a smaller (10″ x 12″) and not too heavy screen is to be preferred. This should be set in a fringe of lead rubber six inches wide. Handles sheathed in lead are attached to the frame for protection of the hand, when manipulating the screen. The old fluoroscopic viewing box consisted of a small screen attached to a pyramidal hood of cardboard, the eyes being applied to the smaller end, so that the examination can be made in a lighted room. This has come into vogue again because of military needs. Such a pyramidal fluoroscopic screen has been described by Dessani. It is to be fitted to the wearer's eyes and kept in position by bands across the head. By a hinged arrangement the fluoroscope may be tilted back out of the line of vision. When so used, the observer looks through a layer of ruby or green glass, which permits operative procedure without desensitizing the eyes.

Too great emphasis cannot be laid on the problem of protection. The Roentgen-Ray is an agent capable of causing considerable damage to the organism. Though this appears to be generally appreciated, it is nevertheless surprising to note the utter disregard of this danger during fluoroscopy, particularly with the use of the Coolidge tube, when many of the limitations which gave a certain margin of safety when the Crookes tube was used, do not exist. Carelessness in providing suitable protective measures is bound, sooner or later, to lead to disastrous results. It must not be forgotten that the late skin effects may, and usually do, come on from four to seven years after prolonged exposure. Immunity from such effects for a year or two instils a false sense of security. Eternal vigilance is the price of an intact skin. Such additional protective devices as lead-rubber gloves are essential and ordinary leather gloves should be worn underneath the rubber gloves. This is particularly important if fluoroscopy be used for the reposition of the fragments. Lead glass goggles and leaded aprons are useful in further increasing the safety of fluoroscopy. The tube, if of the Crookes variety, should be of medium focus and "air regulated"; if of the Coolidge variety, the "sharp" focus tube. With the Coolidge tube the transformer is a simple and convenient and easily controllable method of energization. With the Crookes tube a coil and mercury or mechanical break give the best service.

The quality of the tube should be of sufficiently high vacuum to permit a clear differentiation between cortex and medulla. What should be sought for is detail with sufficient contrast. Should it be necessary to move in and out of the fluoroscopic room, colored glasses should be worn. Sensitization of the eye is extremely important. The illumination of the fluoroscopic room should always be indirect, dim, and of a bluish green tint, the color of the fluorescence of the screen. Sensitization may also be accomplished by tiring the eye for its complementary color, red.

Previous to the examination, the room, which should be well ventilated, and the air kept in motion, should be darkened. The observer should remain in partial darkness for at least ten minutes and in absolute darkness for five minutes, before the first examination is begun. The visible light from the tube itself must be eliminated. The static glow of the wires carrying the high tension may be eliminated by the use of a tin or iron piping or heavily covered cable.

The foot switch should be placed in a convenient situation and permit the control, not only of the energization of the *x*-ray tube, but the general lighting of the room.

The examiner should have everything at hand, so that there need be no stumbling or fumbing in the dark or turning on of lights. He need not necessarily stand directly in front of the screen, for the observation may be made just as accurately when standing to one side and thus out of the direct path of the rays. The examination must be thorough but rapid. The energizing of the tube must be intermittent. It is a foolhardy and useless procedure to fluoroscope a patient over a long period of time. A glance and then an interval for orientation and thought, then another period for observations, followed by a period of darkness, for consideration as to what is observed and what is to be sought or still to be determined. By this method the interest of the patient is safeguarded and prolonged exposure is avoided. It should always be borne in mind that there exists an idiosyncrasy on the part of some individuals to the ray.

Working with a gas tube, whose equivalent spark gap value is seven inches, or with a Coolidge tube of six inches, and using two or three milliamperes of current, through one millimeter of aluminum, an exposure of twelve minutes is the limit of safety at the usual target-skin distance, if a skin reaction is to be avoided. With the constant moving of the body of the patient, incidental to the examination in all directions, no part should, therefore, ever receive a large fraction of a dose.

The disadvantages of fluoroscopy are:

1. The overlooking of fissures and fractures where there is no displacement of fragments or fractures of carpus or tarsus.
2. Exaggeration of deformity by distortion of shadows.
3. Damages of exposure.
4. In operative work, the dangers of explosion from the ignition of the anesthetic by electric spark.

2. Radiographic examination.

For the proper interpretation of the data obtained in the *x*-ray examination of fractures, it is essential that a few technical points be utilized and appreciated.

From the focal point on the target the rays, traveling in straight lines, diverge in all directions. That ray which falls at right angles to the recording surface is the central ray; the rest are divergent. Any structure interposed in their path casts a more or less distorted shadow, depending on the relation between the source of illumination, the object, and the recording surface. There are several roentgenological axioms covering this relationship, which are constantly applied both in technique and interpretation.

1. The nearer the object is to the recording surface, the smaller and sharper its shadow.

Practical application: The part to be studied should be placed as near the plate as possible, thus a sharper shadow of the fibula or the fifth metatarsal is obtained with the plate at the external aspect of the leg than at the internal; of the clavicle in the dorso-ventral view than in the ventro-dorsal.

2. The closer or more nearly an object lies with its long axis parallel to the recording surface, the less the deviation of its shadow by displacement of the source of illumination.

This axiom is utilized in the localization of foreign bodies in the tissues, for, if the shadow of the foreign body is smaller and sharper, when examined from the anterior aspect, then it is located more anteriorly than posteriorly. In the study of the relationship of fragments of a fracture, when views at right angles cannot be made, the fragment with the large, hazier and more distorted shadow is the further from the recording-surface. When the object lies obliquely to the horizontal plane, the recording surface should be placed parallel to it and the central ray directed at right angles to the recording surface.

Corollary: In a part at a distance from the plate the distortion is minimized by increasing the tube object distance. This also becomes necessary when, because of a plaster cast or bandaging it is impossible to bring the part in close apposition to the plate.

3. The further the tube is from the object, the smaller and sharper will be its shadow.

Practical application: The tube distance should be such as to give a minimum distortion. Eighteen inches target-skin distance has been adopted for general purposes.

Thus for the extremities, the target plate distance varies from twenty to twenty-four inches and for the thorax from twenty-six to thirty inches. When it becomes necessary to estimate the diameters of a structure—the distortion is reduced to a minimum by a long tube-plate distance. This is usually two meters.

Note: The intensity of the illumination diminishes in inverse ratio to the square of the target plate distance.

4. The more nearly perpendicular the object is to the central ray, the smaller and sharper the shadow.

The more the divergence of the ray, the greater the distortion of the shadow of the object transilluminated by it. The distortion due to this divergence of the ray may be minimized by increasing the tube-object distance.

Practical application: If a linear object is seen in its true cross section, it lies directly in the path of the central ray. In the examination of the vertebrae, a true shadow will be cast by the body of that one vertebra which lies at right angles to the central bundle, while the distortion will be progressively greater in the vertebra, the further they are from the one transilluminated by the central ray. Therefore, either the target plate distance must be increased (with proportionate increase in exposure and fogging due to secondary radiation), or with the aid of cylinders and diaphragms but two vertebrae are examined at each exposure.

The advantages of the *x*-ray examination may be stated as follows:

1. It permits diagnosis of those fractures in which there is no displacement of fragments and in which the classical clinical signs cannot be obtained, as for instance in fractures of the carpal or tarsal bones, the tibial head, fractures of the posterior part of the internal malleolus of the tibia (interosseous), in fissure fracture of the skull, in incomplete fractures of long bones, in periosteal and in sprain fractures.

2. It permits the diagnosis of lesions in bones which are palpated only with difficulty, as the ribs under the scapula, the coracoid process, the pelvis and vertebrae, the radial head, the neck of the femur.

3. It gives such information regarding direction, variety and number of fracture lines, shape and size of fragments, as cannot be obtained by any other examination.

4. It simplifies the differential diagnosis between diaphyseal fractures and epiphyseal separation. This is important because of the disturbance in growth which may follow epiphyseal separation. The frequent occurrence of fractures of the diaphysis is at one-half to three-quarters above the epiphyseal line and makes the differential diagnosis by clinical means impossible. If the separation is slight, the tear in the periosteum of the diaphysis gives the clue. An excellent rule in an injury about the joints in children is to take both sides for comparison with the same technique. This may obviate the necessity of waiting in some cases for the callus formation to disclose the presence of a fracture.

5. It gives information regarding pathological conditions in which the complicating fracture may be the first manifest indication of such disease, as in benign or malignant tumors, fragilitas ossium—Paget's disease.

6. It furnishes a simple, painless method of diagnosis and of control of treatment, giving information, not only as to position of the fragments and the progress of union, but aiding in the decision regarding operative interference for removal of fragments, foreign bodies, etc.

The commonest errors arise from the following causes:

1. When the parts are incapable of immobilization.

2. When the affected parts cannot be placed in close apposition to the plate.

These errors may be avoided by a careful attention to technique. The immobilization of the part is important because the movement may be blur the bony outline as to make it impossible to definitely determine the fracture line. This is particularly so in the determination of fractures of the skull in children or in fracture of the ribs or in fracture about the shoulder joint.

When immobilization is impossible, rapid exposures must be resorted to. Everything which makes for the comfortable position of the examined limb aids in immobilization. This may be accomplished not only by weights, sand bags, bandages, adhesive plaster, pads and inflated rubber bags, but also by certain positions of the body by which the affected part is put at rest with the muscles relaxed and made to approximate the plate as closely as possible. Any portion of the forearm or arm to be examined properly must be placed at the level of the shoulder. For the examination of the leg it is necessary that the thigh muscles be relaxed. To minimize distortion where approximation of plate to part cannot be obtained, the distance from tube to plate should be increased.

3. When there exist no changes in form and outline of the bone nor any displacement of fragments.

In the examination of fractures there are two considerations:

1. To determine the presence of a fracture.
2. To determine the degree of deformity.

These two conditions cannot always be met with the same examination, since it is frequently necessary purposely to distort the outlines of the bones in order to determine the presence of a fracture. This gives an exaggerated and false picture of the deformity. The latter condition should be judged by a normal exposure. What this term means unfortunately is not generally appreciated. Radiography is now a haphazard procedure. In the production of the radiograph of any part, it is necessary that a definite technique be followed in the arrangement of the relationship of the object to the recording surface and the central ray. Such arrangements have been definitely established and the resulting views of the parts constitute what are called normal exposures.

These views can be obtained only by observing the rules regarding the centering of the central ray over certain bony landmarks, with the parts in certain definite postures. At the joint ends, what is sought is a clear view of the joint, unobscured by the overlapping of bony parts. By the various postures, the bones studied are

brought as close and the long axis as nearly parallel to the recording surface as possible. Thus in the examination of the shoulder, the arrangement is different, depending upon whether it is the gleno-humeral or the acromio-clavicular joint which is to be studied. Thus the scaphoid is to be placed in its long axis to the recording surface, ulnar deflection of carpus and abduction of the thumb must be practised.

The designations utilized in describing the particular exposures of the part indicate ray direction. Thus dorso-ventral indicates that the recording surface is at the ventrum, the tube at the dorsum. Extero-internal indicates that the recording surface is placed to the interior aspect of the limb, with the tube at the external aspect. The complete examination requires at least two views at right angles to each other. As a rule the sagittal and frontal centric views suffice, but frequently the excentric becomes necessary.

It is always advisable to mark the plate with a lead letter R or L, when either right or left side is examined and the lateral exposures with the letters In and Ex, when the internal or external aspect is in contact with the plate.

4. When the examination cannot be made or is made only with difficulty in more than one direction.

Under these circumstances the relative sharpness of the fragments (bearing in mind the axiom that the nearer to the recording surface an object is, the sharper and truer its shadow) will permit the determination of the relationship of the fragments to each other. Thus, in ventro-dorsal sagittal views, the sharper fragment is the one which is displaced posteriorly. This determination often becomes necessary in fractures about the upper end of the femur or humerus. The stereoscopic examination is here of great assistance.

6. When the fracture is in that axis of the bone that makes the examination in a plane perpendicular to the axis of the bone impossible.

These errors may be avoided also by a stereoscopic examination. It is particularly valuable about the joints, to study the direction and extent of fissures and to seek the important information, which is not always easy to obtain, if the fissure extends into the joint. Frequently, however, fissures parallel to the axis of the bone will escape detection and when clinical evidence is strong, it is advisable to wait two or three weeks and then the callus, at the suspected point, makes the diagnosis clear.

Indirect evidence is often valuable as indicating fractures. With a history of trauma, if the shadow of the fifth lumbar vertebra has a marked obliquity or cannot be outlined at all, a fracture should be suspected. Fractures of the articular processes of the vertebrae may be suspected when the malposition of the bodies exists as shown by a change in the alignment of the spinous processes. If, in a suspected case, both the transverse processes of one vertebræ are narrowed and its axis deviates from that of the vertebrae above and below, one must suspect a fracture of the body of the vertebrae. A fracture of the pelvis may be suspected from the hip plate by a study of the lower end of the sacroiliac synchondrosis. The sacrum, like the keystone of an arch, registers any break in the arch by a slipping and consequent distortion of the sacroiliac joint space, the lower part of which should show a normal hip exposure.

7. When the fractures are multiple and at extreme ends of associated bones, as the upper end of the fibula and the lower end of the tibia.

The error of overlooking one of several fractures may frequently be placed at the door of the clinician whose cursory and unsatisfactory clinical examination confines the *x*-ray examination to a certain particular part of the limb, when the proper clinical examination would have included a request of the roentgenologist to include all the parts affected. This is particularly true in hospitals and laboratories where a localization of the lesion is requested in order to facilitate the examination. The Roentgenologist, however, has certain findings which warn him that other fractures should be looked for: for instance, a fracture of the tibia low down with marked displacement of fragments usually is associated with a fracture of the fibula high up. The fracture of the lower end of the ulna usually is associated with a fracture of the radius. A fracture of the pubes usually is associated with a fracture of the ilium. A fracture of the oscalcis frequently is accompanied by a fracture of the internal malleolus of the tibia or of the metatarsal bones. In injuries about the wrist, scrutinize the lower end of the radius, the styloid process of the ulna, the base of the first metacarpal and carpal scaphoid.

8. When the fracture lines are mistaken for artifacts, soft tissue folds (axillary and anal) calcifications of bursae or tendons, epiphyseal lines, epiphyseal scars, supernumerary bones, the fabella being mistaken for fracture of the femoral epicondyles, the os trigonum for fracture through

the posterior process of the astragalus, os peroneum for cuboid fracture, os vesalianum for fracture of the base of the fifth metatarsal and os triangularis or fracture of the styloid process of the ulna. Sesamoids may be mistaken for fragments of a fracture and pulmonary markings for fractures of the ribs, the line of the psoas or fracture of the transverse processes of the vertebrae.

9. When the examinations are made through heavy casts or heavy board splints. Under these circumstances the exposure should be doubled without a change in the quality of the *x*-ray. Subperiosteal fractures and callus formation about complete fractures are frequently undeterminable when heavy casts have been applied, particularly so if the casts are wet.

10. By looking and not seeing. This is easily remedied by a slow and careful perusal of the entire bone length and by a refusal to be rushed into the diagnosis of a wet or dirty plate, but to give as much care and studious contemplation of the plate as the surgeon does of the patient.

DEFORMITY.

One of the important lessons which we have, however, been late to learn is that anatomical restitution of the fracture is not essential for perfect functional and perhaps also for cosmetic results, and that, on the contrary, much harm may be done by overzealous effort to place the fragments in direct continuity. The reconstructive power of the callus is not fully appreciated and particularly where the forces of stress are called strongly into play, the results are frequently astonishing when one compares the condition at the time of fracture and after firm bony union with normal absorption has taken place. But inference as to functional results cannot always be correctly drawn from the radiologic study of the position of the fragments.

CALLUS.

The genesis of the callus to its final transformation into bone is not as a rule studied as closely as it should be. Though in children the hazy shadow of a mass enveloping the fracture ends may be seen at the tenth day, before calcification sets in—in adults, it is visible only when the lime salts are deposited at the end of three weeks, while in the aged its shadow may not be seen before six weeks and even then as having but small extent.

The portion of the callus nearest the bone first shows signs of ossification and then from this point it spreads outward to the periphery, frequently visible even quite a distance above the point of fracture, under the torn periosteum. A bordering line of increased density then becomes visible in the periphery of the callus shadow, marking its outer boundary.

Between its inner boundary and the shaft of the bone a clear space, corresponding to the osteogenetic layer, is visible. The ossification of the callus may be considered at an end when this line disappears and the callus shadow shows no line of demarcation between it and the cortex. If manipulation at this time still shows movement between the fragments, non-union may be diagnosed and means can be taken to stimulate or produce a new callus formation. At first the ossified callus is irregular in its form and show no evidence of bone striae, but under the stress of weights and muscular action there is absorption and the configuration to the normal bone outline. The bone markings characteristic of the bone involved become visible, the sharp points and irregularities of the callus become rounded off. Fragments which do not unite by bone to shaft take on the appearance of sesamoids and show the so-called pseudo-arthritic changes, characterized by an atrophy of their bony structure with sharp bordering of the cortex and the presence of small bony excrescences springing from the periosteum.

SCHEME OF ANALYSIS AND REPORT.

Plate No. Bone. E. L. Part.

Variety { Simple, Sprain, Multiple, Comminuted, Epiphyseal

Line of Fracture { Complete, Incomplete, Greenstick, Fissure

Direct { oblique, longit., trans., spiral, T-shaped, V-shaped, Stellate, Irreg.

Displ. frag. (degree) (0, 1, 2, 3)

Upper frag. (direction)

Lower frag. (direction)

Overlapping

Callus

Complication { Tumor, Inflammation, Foreign body, Systemic diseases

Associated fractures

Pathological findings

Diagnosis.

11 E. 68th St.

HOSPITAL WASTE.

One of the most certain ways of reducing the waste in hospitals is to lessen the number of those needing hospital attention. The salvage of supplies, of time, of labor, of energy, may be partially brought about through an intelligent attempt to secure the salvage of health.—*American Medicine.*

THE VARIETIES OF STRICTURE OF THE RECTUM.

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The rectum is probably the most frequent site, as compared with any other bodily outlet, for stricture. The symptoms and diagnosis of rectal or anal stricture are dependent, in the majority of cases, upon the causation and the degree of obstruction of the bowel. Patients often imagine they have stricture when the sphincters are in constant spasm as the result of a fissure or other painful affection at the anal orifice. Many cases have been treated for stricture when examination with the sigmoidoscope has revealed hypertrophied Houston valves. A stricture may be complicated by the presence of a fistula burrowing from an ulcerated surface in any direction.

A classification of rectal strictures, according to the various causes, may be accepted as follows:

(1) Malignant disease.
(2) Congenital defects.
(3) Traumatisms (operations).
(4) Venereal disease.
(5) Catarrhal inflammations.
(6) Tuberculosis.
(7) Ulcerations.
(8) Spasm of sphincters.
(9) Hypertrophy of Houston's valves.
(10) Pressure from adjacent organs, or tumors.
(11) Acute inflammations.

Concisely stated, the chief symptoms of rectal stricture are constipation, obstipation and fecal impaction with or without blood or mucus in the stools.

The cause and duration of strictures provide a relative form, as the *annular,* a ring-like encircling of the rectum; the *tubular* form, encircling the bowel for several inches, or the *complete* stricture which occludes the entire bowel.

The most frequent sites are at the point where the levator ani muscle encircles the rectum and within three and a half inches from the anal orifice.

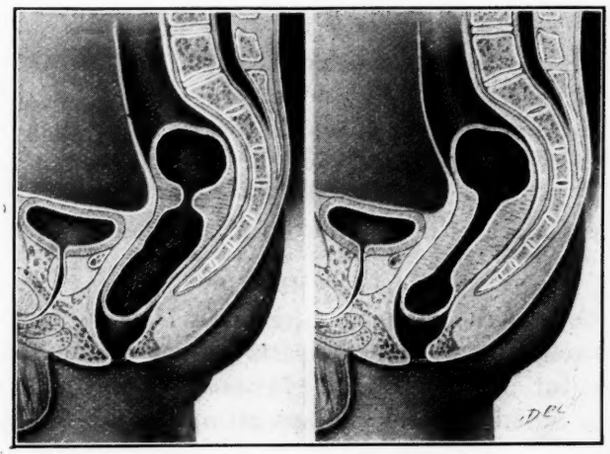
The diagnosis may be made by either a digital examination or by the use of a pneumatic proctoscope, combined with the symptoms elicited from the patient. Sometimes it is necessary to place the patient under a general anesthetic. Great gentleness should be exercised in order to avoid the danger of rupturing the diseased bowel above or below the stricture.

Cancerous stricture which has not undergone apparent ulceration may be differentiated as a firm, inelastic, epithelial growth; *inflammatory* stricture may be accompanied by fever or other constitutional disturbances and supply a history of disease in or about the rectum prior to the formation of the stricture.

Sarcoma is developed from the underlying connective tissue stroma and assumes the polypoid or rounded ball-like shape, seldom annular in form.

Syphilitic stricture is more widespread in its growth, being a proliferating process, and does not assume the band-like characteristics of cancer.

In some instances, however, cancer may involve the mucous membrane by metastasis at several points above or below the stricture, but never so



Annular stricture of the Rectum. Tubular stricture of the Rectum.
From "Dis. of the Rectum and Pelvic Colon."—Bodkin.

extensively as syphilitic infection during the same period of growth. Cancer may push a portion of the healthy mucous membrane before it and give the impression of a connective tissue tumor (sarcoma), but at some place on its surface the epithelial nature of the growth will be discovered in the form of an ulceration with broken-down tissue. A *tuberculous* stricture breaks down almost as rapidly as it is formed and cannot constrict the rectum like the hard, firm, inelastic cancerous tissue.

Ulceration of the rectum may be due to a long-continued, severe hypertrophic catarrhal proctitis, to kidney, heart or lung diseases; to diabetes, follicular proctitis, cancer, primary localized tuberculosis, syphilis, chancroids, traumatisms secondary to operations, or to simple catarrhal or specific inflammations, any of which may cause stricture.

Acute inflammations of the uterus or its adnexa, following operations or otherwise, in which a pelvic abscess burrows down into the pouch of Douglas and invades the rectal wall, sometimes produce stricture. A very severe cellulitis or a peritonitis in

this region may result in several strictures at different portions of the rectum or sigmoid flexure.

Traumatic stricture occurs most frequently as the result of operative procedure within the rectum, or from hemorrhoids. Surgeons who operate by either the ligature or clamp-and-cautery methods too often remove so much of the redundant tissue that when subsequent contraction occurs a stricture at the anal opening is almost inevitable. Infection and inflammation following either of these operations are commonly the cause of stricture.

The treatment of stricture is largely dependent upon the causes, which may be constitutional or local.

290 CLINTON AVENUE.

INFECTIVE PANCREATITIS.

Whether we regard chronic infective pancreatitis as a surgical disease will depend upon our acceptance of the general belief that, as a rule, it is secondary to infective disease of associated organs. For there is nothing that we can do in the way of direct attack upon the pancreas that will promise relief. In the cases, relatively rare, of obstruction of the common bile duct by the swollen or indurated pancreas at the point where the duct tunnels the retro-duodenal portion of the head, as it does in two-thirds of all cases, it is manifestly proper to perform a short-circuiting operation in order that the bile may be conducted into the intestine. This is best effected by an anastomosis between the gall bladder and duodenum. In case of doubt as to the feasibility of this operation the stomach may be used, or failing this, the intestine. If the gall bladder has been removed or is too much diseased the common duct must be implanted into the duodenum. But these are operations not for chronic pancreatitis per se but for the consequences of chronic pancreatitis. When the pancreas has reached the stage of induration with deposits of fibrous tissue between the acini or lobules, with atrophy of the parenchyma, cure is no more to be thought of than in contracted kidney. The damage is done and nothing remains but palliation.—JOHN B. DEAVER, in the *Boston Medical and Surgical Journal.*

COLONIC MASSAGE.

Prompt emptying of any part of the colon by massage is a fallacy. This is especially true of the low cecum, which is usually inaccessible and is often pushed lower and filled fuller than before. The good effects of massage are found in a mashing up of the intestinal contents and a stimulation of muscular tone and slow peristalsis, which usually drive the contents slowly forward for several hours.—F. W. WHITE., M. D., *in the Boston Medical and Surgical Journal.*

TECHNIC FOR THE REMOVAL OF DEAD TEETH.

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The dangers of virulent pathogenic organisms in the jaws are now generally recognized by physicians. Not so generally recognized, however, is the fact that if all men were subjected to Roentgen ray examination, very few of them would be found free from dental pathology directly due to dead teeth.

Resulting from septic conditions in the jaws there may be many metastatic sequelæ,—septic bronchitis; asthma; pneumonia; "rheumatic" joints, muscles, and nerves; heart and kidney lesions; skin eruptions; chronic toxemias; bacteremias; and anemias have been repeatedly traced to dental pathology.

The dangers incident to diseased jaws have been very great in America. And they may be about to become very much greater. The dangers have been great, because American dentists have made a practice of devitalizing teeth and allowing them to remain in the jaws. The dangers may be about to become greater, because American dentists at the present time are devoting much attention to various methods of treating dead teeth; with the new methods of treatment there may come a greater tendency to devitalize teeth and to retain them in the jaws.

Dangerous septic conditions in the jaws are due to dead or devitalized teeth. Such dangerous conditions are bound to increase as long as dentists concentrate their energies on various methods of treating dead teeth even when such teeth are in advanced stages of dissolution.

There should be no question about what a dead tooth is. Some attempts have been made to discriminate between dead teeth and devitalized teeth. Now a devitalized tooth is one from which the pulp has been removed. Such a tooth, men claim, is not necessarily dead. They maintain that the human tooth has two sources of nourishment, the pulp and the pericemental membranes.[1] This claim has nothing to support it; for as soon as the pulp supply of a tooth is interrupted the dentin of the tooth dies. The tooth bone or dentin is cut off from the blood supply of the body. Only by way of the apical foramen can blood or blood fluids enter the pulp chamber of the tooth. After a tooth is devitalized, cementum continues to be deposited on the tooth root from the cementoblasts of the

[1] Brophy: Oral Surgery, 1915—Page 754.

tooth socket. It continues to hold the pericemental fibers in place against the tooth root after the pulp supply has been cut off.

It is impossible for dentin to receive any nourishment through the cementum. Normal cementum is a mere calcic cement substance possessing no inherent genetic powers. Normally it lacks lacunæ and Haversian systems. It is possible that a protoplasmic fluid penetrates through the openings for the pericemental fibres part way through the cementum. This fluid does not reach the dentin; but even if it did, it would not be capable of preserving vitality in the dentin. A pulpless tooth invariably becomes dry, foul and discolored. In examinations of thousands of dead teeth I have not discovered one which has failed to show deleterious changes in the dentin some years after the pulp supply was cut off.

Deleterious changes often fail to attract attention because they may take place very slowly. Nevertheless, these changes will take place no matter how thoroughly a devitalized tooth is embalmed, no matter how skillfully it is treated, no matter by whom it is "preserved." It will become dry, opaque, discolored, solid in its socket and offensively odorous. Treatment may retard decomposition of the organic matter of the tooth, but it will not prevent decomposition. Any student of bacteriology will realize that the embalming of the dead organic matter of a tooth so that the tooth may be retained in the mouth without danger of infection and putrefactive changes is practically impossible, because one end of the tooth is in the mouth with unlimited opportunities for the entrance of micro-organisms into the dentinal tubuli.

Brophy's work on oral surgery published in 1915 has done much to spread misinformation regarding dead teeth. Brophy states that "pulpless teeth which are firm in their sockets, even those teeth which have caused antral infection, may be, with skillful treatment, made sound, healthy and useful and not influence a recurrence of dento alveolar or antral disease."[2] Brophy states further that though diseased teeth may have been the prime cause of abnormalities in other parts, nearly all are amenable to successful treatment. He adds, "with the present advanced knowledge of dental pathology it is assumed that a tooth canal is rendered asceptic," following canal work.[3] Brophy admits that dento alveolar abscess is not a disease of the tooth, but that it has its inception in a tooth. He believes, however, that our knowledge of advanced modern dental pathology is sufficient apparently to treat a dento alveolar abscess without a removal of the tooth. *A practice which, he trusts, may soon become obsolete with all intelligent practitioners.*[4] The key to Brophy's false conceptions will be found in his statement that "a pulpless tooth is not a dead tooth because it is held in vital relation with the circulation by the pericementum."[5]

Were it not for the fact that Brophy is quoted endlessly by the members of both the medical and the dental profession, his shortcomings might have been overlooked. But constant quotation has spread much harmful misinformation. If Brophy had had much personal experience with the embalming of dead teeth he would have known that they all "stink" some years after treatment. He should have learned from the works of Black, Noyes, and Hopewell Smith, even if he did not learn it from clinical experience, that tooth dentin dies once the pulp is destroyed.

Dental students are taught to retain dead teeth in the jaws because dead teeth are useful as organs of mastication. They are taught that their problem is to sterilize dead dentin so as to prevent suppurative and putrefactive changes in the tooth and the surrounding parts of the jaw.

Dead teeth and disintegrated bone at their root ends cannot be effectively treated and drained through the root canals of the teeth. Through a minute opening one attempts to drain an area usually filled with fibrous granulations and different strains of micrococci. It may be possible to render such an area temporarily passive. Putrefactive changes may be retarded and the tooth and the area may be called "cured." But several years after the "cure" pathogenic organisms are commonly found in the apical region of the tooth. When the "cured" tooth is opened the patient commonly perceives a very unpleasant odor and the operator protects himself with a face mask.

With great care extracted teeth have been sewed into a cock's comb to be kept "vital." Then they have been prepared for implanting in a 98° Fahrenheit normal saline solution. Great care has been taken not to injure the "vital cells" in the cementum. Some years after the implanting no roots were left. The crowns of the teeth, discolored and offensive in odor, have rolled into the mouth. Results not worse have been obtained by me from a tooth boiled from half an hour to an hour before it was implanted. And of course no one would hold that a boiled tooth is not a dead tooth. Every tooth from which the pulp has been removed is dead in

[2] Brophy: Oral Surgery, 1915—Page 496.
[3] Brophy: Oral Surgery, 1915—Page 754.
[4] Brophy: Oral Surgery, 1915—Page 764.
[5] Brophy: Oral Surgery, 1915—Page 754.

the generally accepted sense of the term. Every devitalized tooth is a dead tooth.

Infection and putrefactive changes take place in dead teeth irrespective of whether or not they are left sterile following the canal work. Acid forming micro-organisms probably penetrate through the dentinal tubuli and permeate the dentin irrespective of whether or not bacterial growth takes place from the "treated" pulp canal. Toxins and even bacteria may pass slowly from dead roots into the sponge bone and the blood stream of the jaws. Obscure metastatic disturbances may follow of such a nature that irreparable damage or death may precede or follow the diagnosable stage.

Dead teeth like other dead organic structures are subject to the laws of decomposition. They may serve as organs of mastication, but they should not be retained in the jaws because they are a menace to health and even to life. A micro-organism, a toxin, or a poisonous protein introduced into the blood stream from cancellous bone is far more active than is the same amount introduced into the stomach. Since dead teeth cannot be rendered permanently aseptic, they cannot be retained in the jaws with safety.

Dead teeth should not be removed by the old method of extraction. Extraction, with possibly some curetting, generally fails to eradicate the diseased area. A typical case is that of a patient who had had an abscessed tooth extracted thirty years earlier. A hole in the jaw as large as a pea was shown by the roentgenogram at the place of the extraction. Pyogenic granulations and greenish pus were removed from the area of the old extraction. Gas and offensive odors were noticeable. This indicates why systemic ills thought to be due to dead teeth do not disappear when the teeth are extracted. Certain bone lesions are very difficult to eradicate.

Perforations into neighboring cavities or canals may not be shown by extraction followed by blind probing. Such a method is almost as inefficient as the other method of attempting to drain the areas filled with new growth tissue, toxins, and micro-organisms through the root canal of the offending tooth.

Extraction commonly causes fractures of the alveolar process or of the tooth itself, because a dead tooth is usually partially ankylosed and very brittle.

On account of the difficulty of working in the tooth socket extraction makes complete curettement improbable. In many cases the upper part of the septum separating the roots is still intact. This prevents the free sweep of the curette. The deeper pathological cavity cannot be reached through the small opening at the apex of the socket, and there is no opportunity for direct vision of the operative field.

Extraction may fail to remove broken down alveolar process and granulations. These may result in systematic toxemias or bacteremias; or even death resulting from infective thrombosis and embolism following the retention of septic tissue and the opening of the facial veins.

Extraction may fail to disclose such complications as antral perforations, necrotic antral walls and polypi, and pathologic conditions of canals supplying nutrient arteries and nerves of the jaws.

The incomplete removal of necrotic structures by extraction may result in extensive loss of alveolar process caused by chronic low grade suppuration.

Extraction may fail to remove all the pathological area. This in some cases will cause eburnation of the surrounding alveolar process. This increases the difficulty of diagnosis which can be made only by an exploratory operation.

We conclude, then, that dead teeth in which putrefactive changes have taken place should be removed from the jaws; but such dead teeth should not be extracted or pulled as is commonly done.

Infected dead teeth and alveolar process should be removed by a surgical dissection.

The technic to be employed in dissecting out a dead tooth is as follows:[6]

In order to gain space for operating it may be necessary to stip down the gums and periosteum from the healthy tooth on each side of the necrotic one. If this is done the gums must be carefully sutured back to their original position at the end of the operation.

Or it may be necessary only to raise and pull back a triangular flap with its apex at the gingival margin of the necrotic tooth so as to expose the outer plate of bone for a little more than the length of the root.

When the outer plate of bone is exposed part of

[6] Articles by the author on this technic can be found in the:
Pacific Dental Gazette, May, 1915.
California State Journal of Medicine, Nov., 1915.
Pacific Dental Gazette, Feb., 1917.
American Journal of Surgery, August, 1917.
American Journal of Surgery, September, 1917.
Journal of the Cal. State Dental Association, Nov., 1917.
The author has advocated dissection instead of extraction in addresses before the:
San Francisco District Dental Society, March, 1915.
Surgical Section of the S. F. County Med. Society, May, 1915.
Panama Pacific Dental Congress, August, 1915.
St. Luke's Hospital Diagnostic Section, Dec., 1916.
Surgical Section of the S. F. County Med. Society, Jan., 1917.
San Francisco District Dental Society, Oct. 8, 1917.
Surgical Section of the S. F. County Medical Society, Oct. 16, 1917.
Also a paper now in the hands of the editor of the Dental Items of Interest.

it is removed with a chisel so as to expose the cancellous bone and the tooth root. The root may often be used to guide the operator to minute drainage ways into neighboring cavities or canals.

If the part of the buccal plate which is removed is not so long as the root of the tooth, the tooth is hooked out sidewise before the apical exploration is made and the curettement done. If the part of the buccal plate over the entire root length is removed the tooth is hooked out sidewise either before or after the apical exploration and curettement.

At this stage of the operation the region may be blocked off by sterile sponges so that specimens of granulation tissue and pus may be obtained.[7]

When a cavity is discovered beneath the tooth roots, the tooth and the alveolar septum in multirooted teeth are removed with a chisel. The inner plate of the jaw is left intact. When the antrum is affected the inner plate may sometimes be cut away in the upper jaw enough to permit the inner flap of mucous membrane and periosteum to be drawn over to meet the outer flap. Then the operation is completed and the wound closed. But ordinarily the inner plate should not be removed. In it bone regeneration does not take place so nicely as in the outer plate, at least not when both plates are removed at the same time.

Antrum incisions are sutured. The cavity drains through the natural ostium into the nose. The antrum is not packed with gauze unless hemorrhage is excessive. Five or six days after the operation the cavity may be irrigated, if this is necessary. A cannula inserted through the flap from the mouth, or through the thin plate of bone under the inferior turbinate of the nose will allow thorough irrigating.

The operation for the removal of dead teeth may be performed under novocain anesthesia without pain to the patient and with very little shock.

Objections have been brought to this operation on the grounds of bad cosmetic results, the loss of masticating surface, and the lack of alveolar process on which to support a plate.

If the operation is properly performed there can be no bad cosmetic results, for in place of the diseased bone which has been removed new bone forms and fills in the space.

The removal of dead teeth does, of course, mean the temporary loss of masticating surface. However, a sanitary removable bridge or a skeleton plate will generally furnish sufficient and efficient masticating surface.

The loss of foundation for an efficient plate will invariably be more pronounced where inadequate surgery has been done than where complete surgery has been done. Incomplete removal of septic granulations results in a chronic low grade suppuration causing resorption of the alveolar process. If no systematic complications were to follow, the local destruction would be enough to deter thoughtful operators from inadequate attempts at relief.

There are no good reasons then for objections on the grounds of bad cosmetic results, the loss of masticating surface, and the lack of alveolar process for supporting a plate. But even if such objections were justifiable, they would appear to be trifling since the removal of dead teeth is absolutely necessary as a means of preserving normal health and even life.

Five distinct advantages of the operation here advocated are:

1. It never results in fractures such as commonly result from the "pulling" or extracting of ankylosed teeth.

2. The operator has direct access to the diseased bone. This permits him to do the necessary curettement completely and thoroughly. Complete curetteing prevents the retention of septic bone and granulations which may result in systematic toxemias or bacteremias.

3. The operation discloses any pathological conditions of the nasal floor, any vents under the antral membrane, any vents into the nasopalatine canals, and any vents into the dental canal of the mandible.

4. The operation prevents the extensive absorption of the alveolar process which may be caused by a long continued low grade suppuration. Extensive absorption of alveolar process may destroy the foundation necessary for an efficient plate.

5. It allows the filling in of the bone cavity with the gum and periosteum flap. This is favorable to rapid healing and bone formation, and is in conformity with the ideas relating to bone surgery in parts other than the jaws.

We have seen that virulent pathogenic organisms generally accompany dead teeth and that many metastatic lesions are secondary to them. We must conclude, then, that dentists should immediately give up the practice of devitalizing teeth and of treating teeth which are dead and necrotic.

The only safe treatment for a dead tooth is removal from the jaw, since an area of disintegrated bone or new growth tissue cannot be properly

[7] Pure cultures of streptococcus pyogenes, streptococcus mucosus, streptococcus viridan, treptococcus rheumaticus, a short chain hemolytic streptococcus, staphylococcus albus, and what appeared to be the bacillus of influenza have been obtained during these operations; also mixed cultures containing the different families of staphylococcus, micrococcus catarrhalis, a diphthroid bacillus and the Bacillus of Friedlander. Strict anaerobic cultures were invariably negative.

drained and removed through the root canal of the tooth. And even if it could be drained through the canal of the septic tooth, should we have faith in this snag that has caused the trouble, and endow it with a chimerical vitality, treat it with some fleeting antiseptic, and allow it to remain in the body as a culture tube for micro-organisms and a means of escape for bacteria and toxins into the cancellous bone?

Extraction or "pulling" according to the old method, commonly will fail to permit the dentist to remove all of the diseased area. Extraction is fraught with dangers to the patient.

The removal of dead teeth and areas of disintegrated bone should be accomplished by the operation described in this paper. This operation renders certain a clean removal of dead teeth and diseased areas; it results in no harm to the patient; and it commonly results in almost inestimable good.

PREVENTIVE MEDICINE.

The aim of modern medicines, coordinate with the advancement of all the sciences, is the prediction and control of phenomena, the prevention, as inclusive of the cure, of disease. Preventive medicine has no fairer ideal than that contained in the beautiful sentence of Minot: "We have enthroned science in the imagination, but we have crowned her with modesty, for she is at once the reality of human power and the personification of human fallibility."—FIELDING H. GARRISON, M.D.

RECRUITING THE TUBERCULOUS.

One little good has certainly come out of the great mass of evil of this terrible war—that experience in the field has proved that men with slight, old, healed tuberculosis, or doubtful tuberculosis, do not need to be excused from military service, that most cases do well in active service, that they improve in health in the outdoor life, and consequently that our practice in peace has been in error in giving too great weight to slight indications of structural change. If a man presents himself for enlistment who shows slight old pulmonary changes, such changes should be viewed as evidence of bygone disease, cured, and, if the soldier is in vigorous health, to be disregarded in the decision as to his acceptance, and disregarded also in the record of his case, so that if it should unfortunately happen that the man in question should break down with active tuberculosis at a later time his disease will be regarded as incurred in line of duty.—COL. G. E. BUSHNELL, M. C., U. S. A., *in the Medical Record.*

MIND POWER.

The influence of mind on body, of hope and courage and conviction in giving strength and aiding effort is never to be overlooked; and he is a poor practitioner who does not utilize this influence in the treatment of his patients.—*Medical Insurance and Health Conservation.*

DIABETIC RETINITIS.

JOSEPH J. SHAFER, M. D.,
Louisville, Kentucky.

To Hirshberg belongs the honr of having first given the ophthalmic world the classical clinical description of diabetic retinitis, of which there are several forms: First, central punctate diabetis retinitis, which I consider the typical form of the disease. Second, hemorrhagic diabetic retinitis. Third, diabetic albuminuric retinitis, a mixed type between the first two forms. Fourth, albuminuric retinitis in the eyes of diabetics. Under the latter heading may be included numerous cases in diabetics in which considerable albumen is found in addition to sugar, and the ophthalmic picture is similar to that of albuminuric retinitis from which, in its typical forms, it can seldom be differentiated.

(1) Central punctuate diabetic retinitis: In this type the optic nerve head is neither swollen nor clouded. At the posterior pole of the fundus, especially in the macular region, are found numerous ivory white points, spots and stripes which surround the macula in an irregular manner not forming the radiating or star figure which is presented in albuminuric retinitis. These spots are round, oval or irregular in outline; sometimes they are linear or semi-lunar in shape; their margins are oftentimes serrated. Smaller aggregations of these spots are seen between the macula and the optic nerve head near the superior and inferior temporal retinal vessels. Beyond these vessels they may appear as single spots, but they are much rarer on the nasal side of the disc. Some of them cover the small blood vessels, thus showing that they are within the nerve fibre layer. Rarely a blood point is seen in one of them. Larger white spots are of infrequent occurrence. They appear to remain unchanged for years; their number may increase, yet they never coalesce and form larger plaques or group themselves around the macula in radii. Everywhere between these white areas, fine blood points, stripes or little spots (rarely somewhat larger hemorrhages) may be seen. These blood spots usually extend further toward the periphery than the white spots; they also extend further on the nasal side of the disc and beyond the temporal vessels. The periphery of the fundus appears normal; there are no pigmentary alterations. The vitreous contains no opacities nor hemorrhages.

(2) Hemorrhagic diabetic retinitis: In this form extravasations of blood are almost solely found, but no groups of white spots are visible. As in the

preceding type, the disc is sharply defined. The retina and the blood vessels, particularly the larger ones, appear normal. Four different types of hemorrhagic diabetic retinitis may be distinguished: (a) sometimes fine punctiform hemorrhages will be accidentally found when for some reason, as for refractive work, an ophthalmoscopic examination is made, thus urinalysis is suggested when an unsuspected diabetes will be discovered; (b) larger hemorrhages, several millimeters in diameter, which sometimes occur further toward the periphery of the retina, and may enter the vitreous humor and there produce a localized bluish dimness; (c) sudden large hemorrhages in cases in which there is even very little sugar in the urine; fortunately these are rarely observed; (d) hemorrhagic glaucoma, permitting no hope of recovery. Probably it would answer the purpose better to designate this type as retinal hemorrhages in diabetes instead of retinitis, since no evidence of inflammation is observed. Furthermore, it must be understood there are mixed forms in which numerous hemorrhages and white spots are noted.

(3) Diabetic albuminuric retinitis: This form represents a mixture of typical diabetic and albuminuric retinitis. Just as in analyzing the urine albumen and sugar may be found, so there are cases in which an ophthalmoscopic examination may reveal the signs of albuminuric retinitis superadded to the typical picture of diabetic retinitis. In these cases in addition to an opaque and slightly swollen optic nerve head and retina with alterations of the blood vessels characteristic of albuminuric retinitis, there are groups of white spots which are peculiar to diabetic retinitis.

(4) Albuminuric retinitis in eyes of diabetics: It is well known that forms of retinitis may be seen in diabetic subjects which agree in all essential respects with the picture of albuminuric retinitis. Since it is understood that in many (perhaps in most) cases of diabetes, renal infection with the presence of albumen may ensue, and since retinitis is rarely seen in diabetes, it may with great probability be assumed that in these cases the secondary nephritic process which complicates the diabetes produces its own characteristic form of retinitis, viz., an albuminuric retinitis. In other words, there is a purely albuminuric retinitis which is independent of the diabetic process, excepting that it appears in a diabetic subject. Therefore, the term albuminuric retinitis in diabetic eyes, or diabetic subjects, appears the proper one.

THE MADDOX ORTHOPEDIC FRAME.

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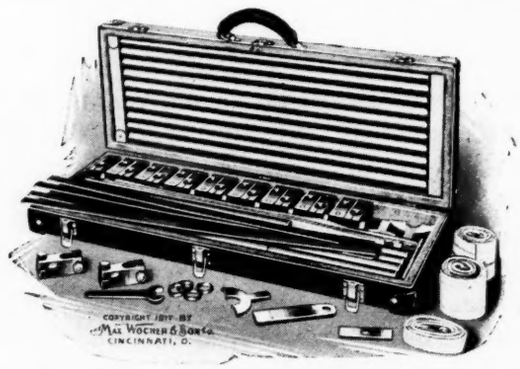
Attending Orthopedic Surgeon, Cincinnati General Hospital; and Junior Surgeon, Episcopal Hospital for Children.

This apparatus has been designed to afford the means of obtaining the necessary corrective traction and support for any part of the body during the application of plaster of paris dressings. It combines, in a comparatively simple and portable form, all of the essential mechanical principles of the several types of supports now in use, and will facilitate the application of all forms of jackets, spicas, and other dressings required in general and orthopedic surgery, when it is impossible to use the larger forms of apparatus. No attempt is made to offer any new



methods or radical departures from the classical forms or present application of plaster dressings, except in as far as the use of this apparatus demands minor variations. The portability and possible adaptations are such as to render it ready for almost any service wherever required, and this must be considered of sufficient importance to offset the increased inconvenience in the application of any specific dressing, over that of a portable apparatus designed especially for a single purpose, or one of the large forms of apparatus, adapted to a variety of uses, which cannot be considered as strictly portable.

In its present form this apparatus is composed of the following parts: ten rods 24 inches long, four rods 16 inches long, two rods 9 inches long, two rods 7 inches long, one 7- and one 9-inch rod being joined to make the pelvic post and head post. When screwed up tight they may be considered as forming a 16-inch rod.

Five rods 8 inches long, two rods 4 inches long, twenty cross clamps, four clamp plates, three crutch tops, two pelvic rest plates, six spring rods, four split rings, three webbing

straps and buckles, two webbing bands, one wrench, one carrying case 26½ in. long, 10½ in. wide, 3½ in. deep outside dimensions; weight, 45 pounds complete.

The primary mechanical principles of this apparatus are essentially a horizontal base rod, a vertical head post and a vertical pelvic post, clamped to the base rod; one or more vertical posts, placed beyond the pelvic post, or between the pelvic post and the head post, and clamped to the base rod; one or more lateral rods clamped

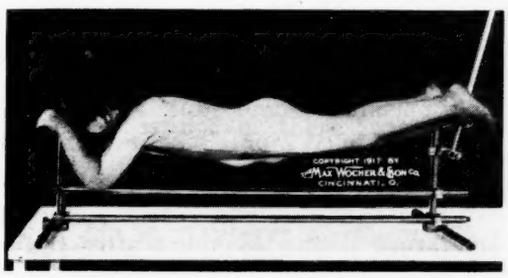


Fig. 1.—Plaster Paris Jacket in recumbency, on webbing straps used as hammock.

to any vertical post below and at right angles to the base rod, to form a lateral base; and suitable fittings for all the vertical posts, to support the springs, rods or webbing bands on which the body rests. As this apparatus is intended to be used on a table or in a bed, any form of support other than the lateral rods under the base rod

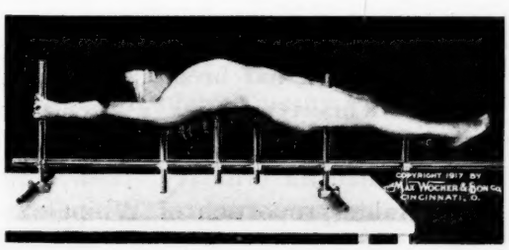


Fig. 2.—Plaster Paris Jacket in recumbency on hammock webbing with corrective traction.

is unnecessary, but may be used. Additional support or traction for any part of the body is obtained by extending a rod or rods from a clamp on the base rod, or any vertical post, in any plane at right angles to the base rod or vertical post, and from a clamp on this first rod, extending a second rod in any plane at right angles to the first rod, and attaching to this second rod the supporting fixture, or the bandage, or strap for traction. All rods or posts, not essential members of support, may be clamped lightly at point of extension, and when so clamped may be axially turned in either direction and locked at any point by means of the clamp, giving a powerful windlass action in all planes parallel or tangent to the base rod. The variations of this form are almost unlimited, provided undue strains are avoided by properly distributing the weight of the patient. The horizontal base rod should be parallel to a second rod when used with webbing bands as a hammock, and should be supported between head and pelvic posts when the

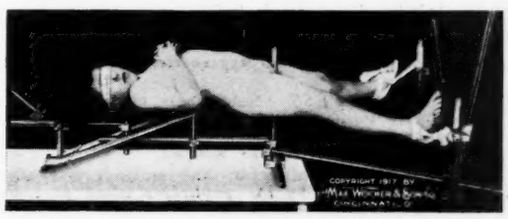


Fig. 3.—For Plaster Paris Jacket in recumbency, on Goldthwaite rods.

patient weighs over 150 pounds. The strain on any rod supported at one point should not exceed 150 pounds when applied at right angles to the

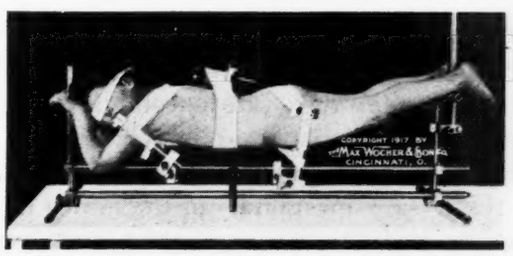


Fig. 4.—Hip Spica or Leg Dressings, with or without traction.

axis of the rod eight inches from the point of support.

The accompanying photographs, taken at the Episcopal Hospital for Children, by Dr. Arch. I.

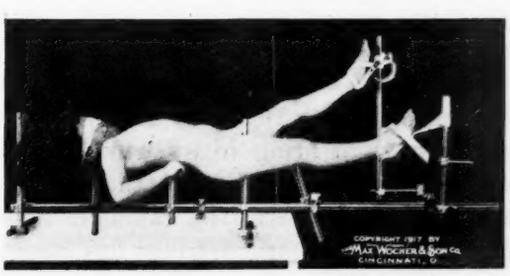


Fig. 5.—For Spica, in abduction with or without traction.

Carson, will serve to explain the construction and use of this apparatus. In these photographs the length of the base rod is 4 feet, and the patient a normal child weighing 78 pounds, no effort being made to obtain marked traction or correction.

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WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, MARCH, 1918.

POST-OPERATIVE PNEUMONIA.

The quest for the "safe anesthetic" has been steady and unceasing and is represented by a prodigious portion of current medical literature. The term "safe anesthetic" in the minds of most investigators connotes one which will not kill the patient while it is being administered or, perhaps, immediately after. With exasperating indifference, however, they forget that the greatest danger from an anesthetic is not what it will do on the operating table, but, rather, the remote effects after the patient has been sent to the wards, by far the most important of which is post-operative pneumonia. For every death on the operating table there are 50 deaths from the later pulmonary complication. It seems, therefore, a huge mockery that the "safest" anesthetic is proven now to bring in its wake the largest post-operative mortality. With the exception of a sporadic article, mostly on casuistic or statistical lines, no systematic attempt has been made to study this formidable complication, especially from the aspect of prophylaxis. It is for this reason that we deem the paper of Whipple (*Surgery, Gynecology and Obstetrics,* January 1918) as one of the most important of the past year. In a comprehensive and thoroughly model study, in which all the modern methods of attacking the subject have been commandeered—namely, clinical, Roentgenological, bacteriological and serological—Whipple makes many original and suggestive observations.

Whipple's article is based upon the study and observation of 97 cases of post-operative pneumonia occurring among 3,719 post-operative patients during the years 1915 and 1916 in Presbyterian Hospital, New York City. The mortality, 2.3%, is unusually high as compared with statistics obtained in previous years at the same hospital. This brings to light Whipple's first important observation, that many pneumonias are discoverable by the *x*-ray long before frank physical signs of consolidation appear. Such cases are by far the more frequent form of post-operative pneumonia, and this accounts for the high incidence in Whipple's series. In surgical clinics such cases are usually ascribed to "post-operative reaction." There patients show a rise of temperature within 48 hours after the operation unaccompanied by a chill. There is usually a moderate cough. The temperature continues high for a day or two and then drops by lysis. During the first few hours of initial high temperature the radiogram shows a shadow in the lungs, usually in one of the lower lobes. At this time the only physical signs are dulness, with diminished breath sounds. Bronchial breathing does not appear until 24 hours after the appearance of the shadow and after the drop in the temperature. Especially interesting from the bacteriological and prognostic viewpoint is the fact that these pneumonias are due to the Type IV pneumococcus, the variety that has been found to be only rarely fatal. This type usually occurs in the mouth of otherwise healthy people who have or recently have had an ordinary "cold." Indeed, in a considerable proportion of Whipple's cases the Type IV pneumococcus was found both in the pre-operative and post-operative sputum. This observation led him to make a most important deduction, namely, that patients who have or recently have had a "cold," unless in extreme emergency, should not be operated upon until every evidence of such a "cold" is past. The importance of this deduction is shown in the fact that as many as 21 of the 97 cases were of this class. Furthermore, Whipple lays emphasis on the fact that it is equally important to guard the patient from catching cold after the operation, and he is convinced that many of these pneumonias are due to careless exposure of the patient after being removed from the operating room.

In his fine discussion of the etiology, which is grouped under six headings, that which interested us most was the heading devoted to the method of anesthesia. A large percentage of post-operative pneumonias followed the use of ether; in Whipple's statistics a still larger percentage followed the use of local anesthetics, but this he ascribes to the fact that this method was employed in nearly all cases in which the patient had a "cold." It is a mistake, therefore, according to him, to speak of a post-operative pneumonia as an anesthesia pneumonia or as an ether pneumonia, even though it is the dominant factor. Nevertheless, owing to the notorious irritant effect of ether upon the respiratory mucus membrane he warns against the use of this anesthetic whenever there is the slightest evidence of infection of any portion of the respiratory tract.

There was a mortality of 25.7% in Whipple's series, truly a formidable mortality. Especially depressing is the fact that many of these patients before operation were in good health; of 61 such patients, 9 died. As Whipple says: "Even one such death in any hospital service is a calamity and one not forgotten by relatives or by the surgeon. To have a patient in the prime of life and good health come into the hospital for an operation of choice and die of a post-operative pneumonia is one of the reasons of the dread of the laity for matters surgical."

His studies are to be continued, and no doubt future communications will maintain the interest aroused by this report. At all events, if we have succeeded in stimulating perusal of this lengthy illuminating study we shall for the present be content.

E. M.

ACUTE PERFORATION OF THE STOMACH OR DUODENUM.

In very recent years numerous communications have amply testified to the division of surgical opinion as to the propriety of doing gastroenterostomy at the primary operation in which an acute perforation is closed. The argument is usually built on two criteria: on the immediate danger which the added procedure entails and on the ultimate good which gastroenterostomy is said to ensure.

As regards the first, there is considerable evidence to show that death after acute perforation finds its cause in the shock of the accident and in the subsequent peritoneal sepsis the latter depending on the interval between perforation and operation. The bulk of experience goes to prove definitely that the addition of the gastroenterostomy adds little, if anything, to the mortality, except in those patients who are desperately ill. As regards the second, men are beginning to believe that gastroenterostomy is not the panacea which it was supposed to be, and the increasing numbers of recurrences of symptoms after operation have led to modifications of, or additions to, the technic and to a more frequent use of other methods of surgical therapy.

There is evidence to show that the mechanism of acute perforation of the stomach or duodenum is analogous to that of acute perforation of the appendix. The gastric or duodenal perforation may take place independently of any pre-existing lesion, or it may occur through the base of an old ulcer. Here one can find the explanation why many of these patients have never had any symptoms before those of perforation and why so many remain permanently well after recovery.

With such a conception it follows that the subject of acute perforation must needs be divorced from that of ulcer, except in those in whom the accident has complicated a pre-existing ulcer. The differentiation of these phenomena, or the determination that both of these lesions coexist, is the primary task of the surgeon whenever, and at the very moment, that a laparotomy is done for an acute perforation. If it can be demonstrated that the perforation is independent of any pre-existing lesion, one may rest assured that simple closure is all that is necessary and that if the patient recovers he will remain permanently well. When, however, an ulcer has pre-existed one may, with equal assuredness, look forward to further symptoms in the period following the convalescence, which will be recognized as the ordinary manifestations of a chronic gastric or duodenal ulcer.

How much better to care for this latter lesion after the dangers of perforation have been safely passed and after adequate study and mature deliberation have been possible. How much better a result should one expect to follow a well-planned method of treatment including therein all the good of medical ante-operative preparation; all the advantages of the proper operation, not hastily done; all the assurance possible for a permanent cure, after proper post-operative care.

A. O. W.

THE NEEDS OF THE MEDICAL SERVICE.*

Under the above caption, Lieut.-Col. R. E. Noble, M. C., U. S. A., presented before the last meeting of the Southern Medical Association, a most admirable paper, which convincingly answers the many questions asked of the Department, which have caused perplexing hours of thought with many doctors.

The communication appears in full in the December issue of the Southern Medical Journal and should be read by every doctor in this country.

In a previous paper by the same writer, presented prior to the time that the United States entered the world struggle, as in the above referred to communication, Col. Noble said: "On the medical profession rests a heavy responsibility, for with the medical profession rests the subject of medical preparedness."

This is a particulrly impressive paragraph and pregnant with truth, and its meaning should sink deep into the heart of every doctor in America. What was a fact before we entered the struggle is more than a fact now, since we have joined forces with our Allies in a world war, and which will only be terminated by the success of our arms.

We have not a sufficient number of medical officers to care for the combatant and other forces now in training. With the new draft soon to be called and the possibility of the raising of an army of between five and ten million, as has been authoritatively foreshadowed, we would repeat, "On the medical profession rests a heavy responsibility, for with the medical profession rests the subject of medical preparedness."

The responsibility of the medical profession of the United States and its importance in the successful outcome of the war cannot be too forcibly impressed upon every doctor who is mentally and physically fit and within the age limit, and they are urged to offer their services now.

That the Surgeon General should have an immense corps of Medical Reserve officers upon which to draw, enabling him to place the individual where he will be best fitted for the service, is manifestly apparent. This will mean efficiency and by efficiency alone can the responsibility now resting upon the medical profession of this country be lessened.

Apply at once for a commission in the Medical Reserve Corps and thus relieve the responsibility which you owe to your country, your profession and yourself.

*Read before the Louisville Medical Club, of Louisville, Ky.

CHOLECYSTECTOMY AND CHOLECYSTOTOMY.

The history of gall-bladder surgery began with timid cholecystostomies, advanced to the bolder operation of cholecystectomy, and continued onwards in a path in which sometimes the one and sometimes the other predominated and became the operation of fashion. It always seemed, however, that cholecystectomy was a more thorough and satisfactory operation in that it could remove more certainly the source of infection and give a greater guarantee against its recurrence. Unfortunately, loyalty to this operation could not always withstand the higher risks of this procedure and when mortality statistics became excessive, there was wavering in the surgical ranks and a return to the simpler operation.

In recent years greater skill and dexterity in carrying out the technic of cholecystectomy has reduced the mortality of this operation to a very low figure and a curious change has taken place. The simple operation of cholecystostomy is being reserved for the patients who are sickest or who are bad surgical risks. Mortalities, therefore, have changed, and the highest mortality is credited to the simplest operation.

One notes with much satisfaction that a sensible view is being taken of this choice of operation in gall-bladder affections. A proper place has gradually been found for each of these two operations and when the indications are well made, each of the two types of procedure are worthy of equal respect.

A. O. W.

WALTER M. BRICKNER, MAJOR, M.R.C. U.S.A.

The Editor-in-Chief of THE AMERICAN JOURNAL OF SURGERY has responded to the call for service with Base Hospital No. 3. During the period of his absence from editorial duties the responsibility for maintaining the high standards of THE AMERICAN JOURNAL OF SURGERY rests upon the associate editors.

Major Brickner's enthusiasm, literary ability and excellent surgical judgment have been placed at the disposal of the Government, and the continuation of his work with the AMERICAN JOURNAL OF SURGERY temporarily must devolve upon his co-workers, who will aim to give as good an account of their stewardship as Major Brickner will undoubtedly give in his new field of work.

The associate editors salute their leader, now in the service, and join with the subscribers in wishing him Godspeed in all his new undertakings.

Surgical Sociology

Ira S. Wile, M.D., Department Editor.

End Results.

What is the end result of hospital treatment? What proportion of patients are actually cured of the conditions for which they enter the nospital? What is the reason for failures? Are hospitals receiving the types of patients for medical and surgical attention which may be benefited to the largest extent under hospital conditions? Are the staffs of hospitals selected with a view to securing the maximum medical and surgical efficiency? Do seniority rules, donations, social standing and medical friendships interfere with the development of the best types of medical and surgical service and result in the exclusion of competents from positions of honor and service? What is to be the basis of determining the character of hospital service and the relative effectiveness of the members of the various departments in hospital organization?

To answer satisfactorily such questions would require the collection of much data, thus far not generally available in medical institutions. The careful analysis of hospital work has revealed numerous shortcomings, most of which can be corrected were the moving spirit present.

The development of the follow-up organizations and the enlargement of social service in connection with large hospitals was the result of a recognition of weaknesses in hospital service which failed to carry a patient from illness through to assured health and continued strength.

A. E. Codman in "A Study in Hospital Efficiency," stresses the necessity of inquiring into the end results of hospital work. The basis of his constructive criticism is the system of hospital organization recommended by the Committee on Standardization of Hospitals of the Clinical Congress of Surgeons. His suggestions are pertinent and throw down a challenge to those responsible for hospital and dispensary work. The successes of treatment are given far more discussion than the failures. The mortality rate of institutions indicates that great advantages are to be derived from an investigation of those conditions in which success has not been achieved.

It is important to fix the responsibility for unsuccessful treatment. According to Codman, the responsibility for surgical failure, although this would apply equally well to medical cases, may depend upon:

1. The physician or surgeon responsible for the treatment.
2. The organization carrying out the detail of the treatment.
3. The disease or condition of the patient.
4. The personal or social conditions preventing the co-operation of the patient.

Obviously imperfections, limitations or failures in treatment may be ascribed to one or more of several causes, including lack of technical knowledge of skill, inadequate medical or surgical judgment, insufficient nursing care or inadequate equipment, and impaired or limited diagnostic skill. Further, causes of unsatisfactory work in or out of a hospital may arise from the incurability of the disease, the refusal of a patient to accept treatment prescribed, or the inexplicable accidents, complications and sequelae over which medicine thus far has not secured control.

Were it possible to scrutinize the case reports of hospitals and investigate the records of dispensaries with a view to ascertaining the part by each or all of these conditions in the end results of their service to the community, there would be a distinct advance in medical and surgical practice. Statistical compilations indicating the number of patients admitted and the number discharged as cured, improved, unimproved, or dead convey merely an idea of gross accomplishment. They fail to point out weaknesses in organization, lack of highest skill, or any other remediable factors entering into the statistical charts.

The suggestion of Codman merits careful consideration and warrants a thorough study of the actual end results in medical and surgical practice. It may be a human frailty to dwell upon one's successes and to ignore or gloss over failures. This, however, is not a characteristic of the man of science. His greatest benefits accrue from pondering over his mistakes and unsuccessful experiments. Facts elicited by the study of end results might be applied in answering the various questions mentioned in the first paragraph.

While the plan of end results has been proposed for organized institutions, the principles implied are strictly applicable to the general practitioner or the specialist in connection with their daily work. A contemplation of the actual end results of treatment, medical or surgical, one year after the cessation of particular medication or operative procedure would be particularly

enlightening. An evening spent in thought upon the failures of specific treatment with a revaluation of methods and technic certainly would carry a reward to be shared by future patients. Too little is known about the end results of medicine and surgery, and every step that will lead to more complete knowledge upon this topic deserves attention. Medicine achieves results which are appreciated, but its failures, even though relatively small in number, merit as much study as those which are termed favorable or successful.

HEALTH INSURANCE.

The North American continent has a very much larger proportion of physicians than any European country. It does not as yet boast of any perceptibly higher standard of health. Shall we assume that these standards are not affected by available medical facilities? Isn't this an admission that the medical profession is a useless burden? Or is the explanation to be found in the fact that for lack of proper organization the American people never utilized their medical facilities to their full capacity? Patients without medical aid on one hand—doctors who have nothing to do, on the other. When health insurance brings these two together, we may find that one doctor for every 700 population is not too much, and that every 700 population can afford through collective effort to support a warden of their health, as it will support more than one teacher, minister or lawyer.

Health insurance is not a panacea. Nor is it a secret remedy. It does not promise to accomplish anything that could not conceivably be accomplished in other ways. But it is a simple, practical, common sense, widely tried out, method of marshalling the financial and medical resources of a civilized community in the fight against the vicious circle of circumstances, under which disease breeds poverty and poverty breeds disease. Surely the medical profession cannot afford to be registered in an attitude of opposition to this social reform.—I. M. RUBINOW, *in The Public Health Journal.*

IS MEDICAL SCIENCE A SHAM?

If modern medical science is a pretense and a sham, if inoculations against typhoid and smallpox are mere dangerous fads, if the health and lives of our brothers and sons who have been called to the colors are not in safe hands, then, in the name of common sense let us abolish the medical department of the Army and substitute instead a corps of chiropractors, naturopaths, mental healers and what-not in its place. If, on the other hand, the value and effectiveness of anti-typhoid inoculation and vaccination have been demonstrated and if everything is being done that modern science can do for the health of the Army, then those sheets that are attempting to disseminate falsehood to undermine the morale, not only of the Army, but of the public, and in other ways give aid and comfort to the enemy, should be promptly suppressed by the Government.—*Journal of the American Medical Association.*

Book Reviews

A Treatise on Regional Surgery. Various Authors. Edited by JOHN FAIRBAIRN BINNIE, A.M., C.M., F.A.C.S., Kansas City, Mo. In three volumes. *Volume 3.* Octavo; 830 pages; 521 illustrations. Philadelphia, P. BLAKISTON'S SON & Co., 1917. $7.00 net.

Volumes 1 and 2 of this treatise have been reviewed in previous numbers of the Journal. Volume 3 discusses the surgical diseases of the upper and lower extremities and of the chest. One notes with great satisfaction that each subject is described by an expert in the field.

In a general way this volume is perhaps the best of the three. Each subject is treated more in detail, more clearly, and bears the added value of expert experience. The chapters written by Sir Robert Jones are worthy of special mention, and he has added a very timely discussion of the after treatment of the deformities produced by poliomyelitis.

Thoracic surgery is a virgin field. What one knows, what little experience has been acquired by eminent surgeons in all parts of the world, has been diligently gathered and ably described in the article of Lilienthal and Gerster. They bring the subject up to date, and the abundant literature which is quoted will give the student criteria upon which to found personal conceptions of the pitfalls to be encountered and to be avoided and of the methods which, up to the present, have yielded the greatest number of successes in this pioneer field of surgery.

Military Orthopaedic Surgery. Prepared by The Orthopaedic Council. Duodecimo, 234+6; illustrated. Philadelphia and New York, LEA & FEBIGER, 1918. $1.50 net.

The manuals which are being issued under the supervision of the Surgeon-General and the Council of National Defence is enriched by the volume prepared by the Orthopaedic Council. The subject matter is adapted to the needs of military surgeons and is based upon the practical experience of medical colleagues, who become familiar in service with the numerous orthopaedic difficulties consequent to warfare. Considerable of the material has been taken from the writings of Col. Sir Robert Jones and Col. Edward L. Munson, U.S.A.

The contents cover the care of the soldier's feet, with almost as much stress upon prophylaxis as upon the method of treatment required for disabilities. Chapters devoted to injuries of joints and their treatment have been carefully prepared, and in their brevity might serve as patterns in the preparation of manuals for the use of students.

Particularly valuable are the chapters devoted to ununited and malunited fractures and bone grafting, while the discussion on methods of fixation is especially valuable because of the well-selected illustrative material indicative of the use of splints, plaster paris dressings and other orthopaedic apparatus.

The simplicity and practicality of the volume are no less characteristic than its readability. Its value is greater than that ordinarily attributed to a manual, and its usefulness involves more than military operations.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College, Philadelphia. Assisted by LEIGHTON F. APPLEMAN, M.D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia. December 1, 1917, LEA & FEBIGER, Philadelphia and New York.

Always helpful in keeping the profession abreast of current literature, the last quarterly digest lives up to its reputation. Particularly valuable are those sections of the book dealing with topics which are related to war problems. One-third of the book is devoted to the discussion of military surgery, the rest of the contents are

devoted to the diseases of the digestive tract and allied organs, diseases of the kidneys, genito-urinary diseases, and practical therapeutics.

Neurosyphilis. Modern Systematic Diagnosis and Treatment presented in 137 Case Histories. E. E. Southard, M.D., Sc.D., Bullard Professor of Neuropathology, Harvard Medical School; Pathologist, Massachusetts Commission on Mental Diseases; Director Psychopathic Department, Boston State Hospital; Vice-President, American Medico-Psychological Association; and H. C. Solomon, M.D., Instructor in Neuropathology and in Psychiatry, Harvard Medical School; Special Investigator in Brain Syphilis, Massachusetts Commission on Mental Diseases; Acting Chief-of-Staff, Psychopathic Department, Boston State Hospital. With an introduction by James Jackson Putnam, M.D., Professor Emeritus of Diseases of the Nervous System, Harvard Medical School. Octavo; 496 pages; illustrated. Boston, W. M. Leonard, 1917.

This volume makes use of the "case history method" of teaching the subject of neurosyphilis. The book is divided into a number of sections dealing with the nature and forms of syphilis of the nervous system, the systematic diagnosis of these forms, the differential diagnosis from other puzzling conditions, and the treatment which is at present thought to be correct. A chapter is added on the manifestations of neurosyphilis which have been seen in the war zones. Finally, short descriptions are given of the tests used in neurosyphilis. On the whole, the book is elementary, and while, perhaps, it may be useful to the student, the method used in presenting the subject matter precludes any scientific discussion, such as would be demanded by the serious and advanced student.

Physical Diagnosis. W. D. Rose, M.D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the Medical Department of the University of Arkansas. 499 pages; 294 illustrations. C. V. Mosby Company, 1917.

Rose endeavored to place within the covers of this compact volume the guiding and useful principles of physical diagnosis in general and their particular applicability to the usual diseases of the circulatory and respiratory systems.

Section one consists of the clinical anatomy of the thorax; section two considers the physical examination of the respiratory organs—here are included mensuration of the thorax and *x*-ray aids. Section four takes up the diseases of the respiratory system. The following section considers the heart. Parts two, three and four are devoted, respectively, to the discussions of the head and neck and the nervous system. The illustrations are clear, apt, and not infrequently original.

The Baby's Food, Recipes for the Preparation of Food for Infants and Children. Isaac A. Abt, M.D., Professor of Diseases of Children in the Northwestern University Medical School. 143 pages. W. B. Saunders Company. $1.25.

This little book is a collection of recipes of the most commonly used foods for infants and children. The subject matter includes the recent and established formulæ for milk preparations, as well as clear and full directions for preparing many ordinary articles of diet. A few diet lists are appended; also a short chapter on baths and packs for the baby.

Surgical Clinics of Chicago. December, 1917. Vol. 1, No. 6, with illustrations. Philadelphia and London, W. B. Saunders Company, 1917.

This volume exhibits the same general excellence as its predecessors. It contains a large number of excellent articles. Deserving of special mention are the clinics of Dr. Lewis, Dr. Bevan, Dr. Carl Beck and Dr. Eisendrath.

Books Received

Military Ophthalmic Surgery. Allen Greenwood, M.D., Recently Honorary Lieut.-Colonel, Harvard Surgical Unit with the Royal Army Medical Corps, British Expeditionary Force. Including a Chapter on Trachoma and Other Contagious Conjunctival Diseases by G. E. de Schweinitz, M.D., Major, M.R.C., U.S.A., and a Chapter on Ocular Malingering by Walter R. Parker, M.D., Major, M.R.C., U.S.A. Illustrated. Duodecimo, 115 pages. Price $1.50. Lea & Febiger, Philadelphia and New York, 1917.

An International System of Ophthalmic Practice. Edited by Walter L. Pyle, A.M., M.D., Philadelphia, Member of the American Ophthalmological Society. **Medical Ophthalmology.** Arnold Knapp, M.D., Professor of Ophthalmology, Columbia University, Executive Surgeon Herman Knapp Memorial Eye Hospital.. Octavo, 480+29; 32 illustrations. Philadelphia, P. Blakiston's Son & Co. Price $4.00.

Radiography and Radio-Therapeutics. Robert Knox, M.D., Consulting Radiologist, Great Northern Central Hospital, London; Hon. Radiographer, King's College Hospital, London; Director, Electrical and Radio-Therapeutic Department, Cancer Hospital, London; Captain R. A. M. C. (T.) 4th London General Hospital (In Charge of X-Ray Department). *Part I, Radiography,* With Seventy-Eight Plates (one in colour) and Three Hundred and Thirty-Seven Illustrations. Octavo, 382 pages. New York: The Macmillan Company, London: A. & C. Black, Ltd., 1917, Price, $9.00.

A Clinical Treatise on Diseases of the Heart. For the General Practitioner. Edward E. Cornwall, Ph.B., M.D., Attending Physician, Williamsburgh and Norwegian Hospitals; Consulting Physician, Bethany Deaconesses' Hospital; Formerly Professor of Medicine, Brooklyn Post-Graduate Medical School. Octavo; pages 127. Price $1.50. New York, Rebman Company, 1917.

A Handbook on Antiseptics. Henry Drysdale Dakin, M.D., Sc., F.I.C., F.R.S., and Edward Kellogg Durham, M.D., Emeritus Professor of Pathology, University of Bellevue Hospital Medical College; Major, M.R.C., U.S.A. Duodecimo, 126+3. New York, The Macmillan Company, 1917.

Vaccine Therapy.

In the treatment of a moderate number of chronic infections, particularly those of a pustular nature and produced by the staphylococci, vaccines are of greater use than are other methods at our command.

As a rule, autogenous vaccines are preferable and are absolutely necessary, if we wish results in the treatment of colon bacillus infections.

Those who study their cases, who make exact bacteriological diagnosis and who administer autogenous vaccines, with a proper dosage and at correct intervals, will invariably get better results than those who hazard a guess as to the nature of the offending organism, who obtain a vaccine that may or may not contain the causative organism, and who give a dose every day until the vaccine is exhausted.

That performance is *not* vaccine therapy (as defined by Wright), but it is surprising how much of such slovenly practice masquerades under that title.—Stone, *in the New York State Journal of Medicine.*

Progress in Surgery

A Résumé of Recent Literature.

Selection of Cases for Prostatectomy. JOHN B. DEAVER. *The Pennsylvania Medical Journal,* November, 1917.

Prostatics should be gotten into the best possible condition as regards the functional capacity of their vital organs before operation is undertaken. Of great importance is the development of some method for determining this point accurately before operation so that a correct prognosis can be made.

The immediate general operative mortality in America is 20 per cent., while among the leading urological surgeons it is about 6 per cent. The majority of the poor results followed the perineal operation, these included 38 cases of fistula or incontinence. The chief cause of death is kidney insufficiency, others are sepsis, hemorrhage, vascular breakdown, pneumonia and diabetic coma.

Patients with acute complete retention died if subjected to immediate operation, but with suitable preoperative treatment the patients bore the operation safely. Preoperative treatment has become highly efficient and has been aided by suitable methods of determining the functional capacity of the kidneys. The essential part of the preoperative treatment is bladder drainage. This may be obtained by cystotomy (in the badly infected cases) or by catheter. The latter should be used in cases which are in poor condition, in which cases also a two stage operation is indicated. Cystoscopy in the bad cases is usually dangerous.

The fitness of the patient for urological surgery depends on his renal capacity. Acidosis if marked is indicative of uncertain results. In a certain group there are grave accompanying lesions which are suspected only when expected improvement does not materialize after operation.

Chronic Surgical Prostatitis. B. A. THOMAS, *Surgery, Gynecology and Obstetrics,* January, 1918.

Chronic prostatitis may be and is at times a surgical disease, requiring prostatotomy for its most efficient treatment. Associated lesions of the bladder, such a polypoid, papillary or nodular formations of the mucosa of the prostatic urethra and vesical orifice, may be removed at the same time as the prostatotomy is done. For the latter, fulguration or the high frequency spark, promises to offer the best method of intraurethral treatment. In protracted cases of chronic prostatitis, cysto-urethroscopy is always indicated, and may be obligatory for proper diagnosis and treatment.

The Treatment of Gonorrheal Epididymitis Complicated by Peri-Epididymitis. CHARLES S. VIVIAN, Humboldt, Arizona. *Annals of Surgery,* January, 1918.

The author believes in the therapeutic efficacy of epididymotomy for this condition and states that if the temperature does not fall to normal within 48 hours the relief of pressure has not been sufficient. More radical measures are then indicated. These include an open operation and multiple punctures of the epididymis with a blunt probe, with drainage of the organ through these puncture holes by a number of twisted strands of silkwormgut for 48 hours.

Gunshot Wounds of the Kidney and Ureters as Seen at the Base. ANDREW FULLERTON. *British Journal of Surgery,* October, 1917.

Wounds involving the hilum may tear the main artery, in which case death may occur within a very short time, or may tear only one of the branches. In the parenchyma there may be a simple contusion, or a tangential wound, or larger or smaller parts may be torn away or extensively lacerated. A tear into the pelvis causes urinary extravasation either into the perirenal tissues or into the peritoneal cavity with a following peritonitis. The portion damaged or supplied by the torn vessel undergoes necrosis.

Cystoscopy was employed in a number of the cases to determine any loss of function and in the latent cases the presence of injury.

The roentgen ray was employed to advantage to determine the presence of and to locate accurately the position of missile fragments.

Associated injuries were present in the pleura, liver, spleen, spine, hollow viscera, pancreas, and diaphragm. The complications which were seen include sepsis, secondary hemorrhage and urinary fistula. The last occurs when there is a wound of the pelvis, or the tear in the parenchyma extends into the pelvis, or when the ureter is torn.

The chief causes of death were sepsis and secondary hemorrhage. There were 42 cases studied; of these 5 died.

Methods and Results of Transplantation of Bone in the Repair of Defects Caused by Injury or Disease. ERNEST W. HEY GROVES. *British Journal of Surgery,* October, 1917.

In an excellent review the various theories propounded are described and an attempt is made to show how these really correspond. Much experimental work is described and from all of these facts a number of rules are deduced to aid one in transplantation work.

These include the following: An aseptic technic. The exclusion of all sources of infection including the latent variety. The excision of all scar tissue. A graft taken better from the tibia, fibula or rib and including both periosteum and medulla. In certain cases as with bony structures of complicated shape (head of femur) the graft can be taken from a body dead a short while. The proper preparation of the bone to be repaired is important and a good "fit" of graft and bed should be obtained. The graft should be efficiently fixed with appropriate sutures. In preparing the bed the periosteum should be freely raised to obtain good exposure and to stimulate bone formation. The after-treatment is very important and good support must be afforded until proper healing is obtained.

A Contribution to the Pathology of Projectile Fracture of Limb Bones. E. K. MARTIN and G. F. PETRIE, *British Journal of Surgery,* October, 1917.

From the surface of a divided or fractured bone exposed to infection bacteria may penetrate into the deep parts and the extent of the penetration is apparently unlimited when the fracture is untreated. Penetration is much reduced or prevented when the dead surfaces in a fractured bone are removed. It is increased by obstruction to drainage and particularly for anaerobes by reduction of the circulation. The order of frequency and power of penetration of the bacteria found is (1) streptococci, (2) staphylococci, (3) anaerobes and (4) colon bacilli. The rate of penetration is at its maximum during the first few days. Bruising does not appear to facilitate the penetration if the surface layer of debris is removed and drainage established. In a septic fracture the growth of bacteria is progressive and may infect a distant part as, for instance, a joint.

Chronic Internal Hydrocephalus: The Newer Methods for Its Recognition and Treatment. CHARLES A. ELSBERG. *Interstate Medical Journal,* December, 1917.

There is considerable experimental and clinical evidence to show that there is a circulation of cerebrospinal fluid and that it follows a regular course. Under normal conditions it is secreted in the ventricles and leaves them to be absorbed from the subarachnoid space of the brain and spinal cord directly into the blood stream.

If the secretion is retained in the ventricles by an obstruction in the aqueduct or in the foramina of Majendie and Luschka, there is an obstructive type of hydrocephalus. The non-obstructive hydrocephalus is divided into that due to hypersecretion and that due to diminished absorption.

A method of determining which of these varieties ex-

ists depends on the amount of phenolsulphonephthalein which appears in the urine within a definite period after injection into the ventricles or subarachnoid space.

In the obstructive types a new channel should be made between ventricles and the subarachnoid space by a corpus callosum puncture. In the type due to hypersecretion, lumbar puncture should be done every few days and thyroid extract should be exhibited in increasing doses. In those due to diminished absorption, treatment is not successful.

Broken Neck. CHARLES E. HAWKES, Providence. *International Journal of Surgery,* January, 1918.

There were 91 cases of fracture of the spine distributed among 86 males and 5 females. The ages varied from 7 to 76 years. Sixty-two died in the hospital, a mortality of 68%.

There were 35 fractures of the cervical spine with a mortality of 77%; 44 fractures in the dorsal region with a mortality of 68%; 13 fractures in the lumbar region with a mortality of 54%. Of the 29 survivors, 21 were more or less crippled by continued motor or sensory paralysis. These were in the hospital for from 7 days to 10 months. The best results were obtained in the lumbar region, the poorest in the dorsal.

Laminectomy was done 23 times with a mortality of 74%. No operation was done in 67 cases, with a mortality of 67%. The cases should not be operated upon as a routine measure. There should be some definite pathological condition demanding operation, indicated by symptoms and by the *x*-ray findings.

The more important symptoms included unconsciousness, paralyses of different kinds, cystitis and priapism. The length of life after injury was as follows:
Of the fatal cases 14 died on the day of injury;

25 died before the tenth day;
10 died before the twenty-first day;
3 died before the end of the fourth week;
10 died beyond the last period.

Fractures of the Spine with Cord and Root Symptoms. CHARLES A. ELSBERG, New York. *Annals of Surgery,* January, 1918.

In cervical and dorsal injuries with transverse cord symptoms an operation should never be performed until distinct and definite signs of returning sensation and reflexes give proof that part of the transverse diameter of the cord is intact.

In crushing injuries of the lumbar vertebrae, in which the roots of the cauda equina are affected, a laminectomy should be performed as soon as shock has been overcome and after an *x*-ray picture has been taken. There is considerable experimental and clinical evidence to show that regeneration of divided caudal nerves can occur, and laminectomy and suture of the divided nerves should be performed.

Patients with evidence of an incomplete cord lesion should be operated upon very quickly after the injury unless the signs of interference with function are so slight that no justification for surgical therapy exists, the general condition of the patient is so poor that delay is imperative, or unless the coexistence of other injuries precludes operative interference.

Pulse Rate and Blood Pressure Observations as an Aid in the Treatment of Head Traumas. PAUL R SIEBER, Pittsburgh. *Annals of Surgery,* January, 1918.

A rapid encroachment upon the intracranial space by any foreign body produces anemia of the brain and medulla and is associated with a psychologcial response represented by an increase in the general arterial pressure and a decrease in the pulse rate.

The associated intracranial complications are the dangerous factors in fractures of the skull.

When the intracranial pressure equals or exceeds the arterial pressure death results. Frequent blood-pressure and pulse-rate observations not only determine the degree of intracranial pressure, but may be utilized as indications for or against the advisability of relieving the pressure. The latter should be relieved before the advanced stage of medullary compression. Subtemporal decompression is the method of choice for furnishing the desired relief.

With these facts as criteria, fractures of the skull may be classified as those which never show increase of pressure; those with a definite increase in the pressure, and those with advanced medullary compression.

Methylene Blue in the Diagnosis of Acute Perforating Gastric and Duodenal Ulcers. HILLER L. BAKER. *Surgery, Gynecology and Obstetrics,* December, 1917.

As an aid in diagnosis of acute perforating ulcer of the stomach or duodenum. Baker has found medicinal methylene blue of value. He uses three grains to an ounce of water to be swallowed from half to one hour before operation. At laparotomy the green fluid may point to the site of the ulcer as it may be seen to squirt through on manipulation of the stomach or intestine. The greenish discoloration of the peritorieum at once indicates a perforative condition. If the appendix is found to be normal in the presence of such discoloration, the diagnosis becomes obvious.

Gastroduodenostomy: Its Indications and Technic. DONALD C. BALFOUR, Rochester, N. Y. *Annals of Surgery,* January, 1918.

Gastroduodenostomy is indicated when an ulcer involves the pylorus and is associated with obstruction and with ballooning of the duodenum, especially when there is fixation to the pancreas or liver. It is especially called for when gastroenterostomy is not possible because of anatomical derangements. It is desirable when a previous gastroenterostomy has been a failure. The latter should then be divided and a gastroduodenostomy should be done.

The Importance of An Eye-Ground Examination in Infants After Difficult Delivery With or Without the Aid of Instruments. J. A. KEARNEY. *American Journal of Obstetrics, etc.,* December, 1917.

Ophthalmoscopic examination of the eyes in suspected cases of subdural hemorrhage, due to forceps delivery or other obstetric trauma can lead to correct diagnosis at an early stage, that is, the first few days of post natal life. The mild edematous blurring of the upper and lower margins of the disc and the nasal half of the disc and its margins in the first few days after the birth of the child, is characteristic for moderate intracrainial hemorrhage. When the latter is marked, the disc changes are correspondingly deepened. Lumbar puncture obtaining a bloody cerebro-spinal fluid is additional evidence of intracranial injury. Early decompression and drainage may save a great deal of the spastic type of paralysis which is estimated to result in 70 per cent. of the cases as due to congenital trauma.

Uterine Fibroids With Reference to Their Tendency to Become Sarcomatous. FRANK WARNER. *American Journal of Obstetrics,* December, 1917.

Of 100 consecutive cases of uterine fibroids, Warner found sarcoma twice and in five cases the leiomyomata showed a strong disposition to sarcomatoris change. Hence, he advises early removal of these tumors.

The Fossa of Rosenmuller from the Rhinological Standpoint. SIDNEY YANKAUER, New York. *The Laryngoscope,* December, 1917.

In discussing the relationship of the fossa of Rosenmuller to a group of nasal symptoms, in contradistinction to the aural symptoms usually associated with disease of this region, Yankauer describes at length the anatomy and the physiology.

The chief lesion in this region appears to be, according to Yankauer, adhesions between the posterior pharyngeal wall and the edge of the Eustachian eminence. These are formed by the edge of an inflamed adenoid mass becoming adherent to the eminence and later, either through adenoidectomy or the natural retrogression of the adenoids, the lateral comb of the vegetation remains as a bond between the eminence and the posterior pharyngeal wall, drawing the latter forward and upward and decidedly diminishing the volume of the nasopharynx. Behind the adhesions the fossa is changed from an open farrow into a cavity that slowly fills with secretion. This damming-back process is aided by the musculature of the pharnyx—the fossa of Rosenmuller corresponding to that part of the pharyngeal aponeurosis which is not covered by the constrictor—the sinus of Morgagni.

The conclusions drawn by the author from his studies of this region are:

1. Diseased conditions of the fossa of Rosenmuller may give rise to a degree of nasal obstruction equally as great as that caused by hypertrophied adenoids, and persistent nasal obstruction after the removal of large masses of adenoids may be explained thereby.

2. Secretions pouring over the tip of the Eustachian eminence, when in front of the salpingo-nasal fold, is indicative of disease in the posterior group of nasal accessory sinuses. Secretion in the fossa of Rosenmuller behind the salpingo-nasal fold, particularly when associated with adhesions in this region, may cause a clinical picture closely resembling disease of the accessory sinuses, even though the latter are entirely free from pathological changes.

3. It is not impossible that a fossa whose drainage is obstructed may be the focus of a general systemic infection.

4. Reflex nasal and laryngeal neuroses may have their origin in this region.

Nasal Septum Deformity in Children. A Study of 314 Children. LOUIS G. KAEMPFER, New York. *The Laryngoscope,* December, 1917.

Examining several hundred children in the first four years of life, the author found a surprisingly large number with septal deformity of slighter or greater degree.

In summarizing the theories that have been advanced to account for the deformity, he agrees with Yankauer that it is a mechanical change dependent upon a slight primary difference in the width of the nares and an accentuation of that difference by the gradually increasing negative pressure on the narrower side. He differs with him, however, in his interpretation of the mechanism of the process.

The deformities are divided into two groups—patent deviations and "thickened" septa, a group of borderline cases which he thinks may later develop into deviations. He deduces the significant fact that while in the younger children these borderline cases predominate, as the children grow older they become fewer and the true deviations increase.

Another point that the author makes is that the deformities occur with somewhat greater frequency associated with enlarged or diseased tonsils. He thinks that the removal of the tonsils and adenoids in children with "thickened" septa—that is, in children where there is a tendency toward the development of deviation—may have a deterrent effect.

The Intraperitoneal Injection of Saline Solution. KENNETH D. BLACKFAN and KENNETH F. MAXCY. *American Journal of Diseases of Children,* January, 1918.

These authors point out the great need for the administration of water to patients with severe nutritional disturbances, especially after a great loss of body fluids. Often vomiting and diarrhoea prevents the intake of water by mouth or rectum. Intravenous injection may be difficult and it may throw too great a burden upon the circulation if the amount used is large; subcutaneous injection is slow in its results. To overcome these objections Blackfan and Maxcy inject water directly into the peritoneal cavity. The amount employed varies with the size of the patient. In very small infants 100 to 250 cc. may be introduced every 12 to 24 hours. Absorption is rapid and is not influenced by posture.

The technic is simple. The patient is placed in a recumbent position, the limbs restrained by a jacket. The spot for injection is just below the umbilicus in the linea alba. The needle is introduced pointing upward and the normal saline solution allowed to run in slowly. A sterile dressing is applied.

The beneficial effects of this form of therapy are apparent immediately. The patient very soon shows the effect of fluid retained. The authors quote 9 cases with very encouraging results.

Ameria from Mercury (Amerie Mercurielle). G. MILIAU and MOUGEUC DE SAINT-AVID. *Paris Medical,* September 8, 1917.

The authors cite in detail a remarkable case of ameria following the therapeutic use of protoiodid of mercury for hives. Only two pills were given by mouth, and within 2 days there was a distinct ameria and soon a metallic odor of mercury from the patient's breath. The patient developed an absolute ameria for 2 days. There were no signs of uremia except gastrointestinal symptoms, but there was marked nephritis of an acute type and retention of nitrogenous products in the patient's serum.

They gave glucose intravenously with surprising benefit. Sixty grams of glucose in 200 c.c. of distilled water were administered and diuresis set in promptly and continued for several days.

The Pre-operative Reduction of Epithelioma by Roentgen Rays or Radium. DOUGLAS W. MONTGOMERY and GEORGE D. CULVER. *The Journal of Cutaneous Diseases,* December, 1917.

A primary radiation with radium is now an accepted principle in the operative treatment of cancer in certain localities, as for example, in the cervix uteri, the rectum, the tongue and lips. In some cases the resulting scarring and deformity may be notably reduced and, when the growths are inoperable, they be brought well within the limits of more easy eradication.

Vincent's Angina. THOMAS HUBBARD, Toledo, O. *The Laryngoscope,* November, 1917.

Hubbard calls attention to the fact that many of the reported cases of Vincent's Angina have been fatal and deduces therefrom that, despite the admirable work of Mayer and others, this disease is frequently overlooked and is often regarded rather as a pathological "curio" than as a common type of infection.

Spirrillar infections are common in the mouth and throat and vary in virulence and extent. The group includes the pseudo membranous tonsillitis and pharyngitis, ulcerative tonsillitis and noma. It may invade the cervical glands and causes extensive and fatal necrosis and may extend into the esophagus.

It may in instances be confounded with syphilis or diphtheria and all cases should be studied in the laboratory. The dark field condenser must be employed to distinguish the organism from other spirrilla found in the mouth.

The treatment recommended by the author is locally, perborate of sodium in powder, iodine in glycerine and a mild gargle such as Dobell solution. Internally he gives cacodylate of sodium 2½ to 5 grains to be repeated in 24 or 48 hours, and in the malignant cases neosalvarsan intravenously.

The Use of Dichloramine-T in the Treatment of Infections and Infected Wounds. WALTER E. LEE and WILLIAM P. FURNESS. *Annals of Surgery*, January, 1918.

In handling Dichloramine-T or any of its solutions particular attention should be paid to the following points:

All bottles containing the solution previously should be thoroughly dried and should be made of dark glass. No solutions should be returned to the stock bottles. Before using bottles again in which the solution had undergone decomposition they should be cleansed with hot water and dried thoroughly.

Droppers, or glass rods, which are used to transfer any solution from the bottle to the wound should be thoroughly dry before being inserted into the bottles; otherwise water gradually accumulates and hastens the decomposition of the solution.

The general preparatory treatment of the wound is similar to that described by Carrel. The wounds can be rendered sterile and when sufficiently large can be secondarily sutured.

Further Observations on the Results of Blood Transfusion in War Surgery. L. BRUCE ROBERTSON and C. GORDON WATSON. *Annals of Surgery*, January, 1918.

Many cases admitted in an inoperable condition from severe hemorrhage have been rendered operable by blood transfusion. The largest factor in the causation of shock in war wounds is the loss of blood. This does not apply to visceral injuries, however.

Hemolysis occurred in two patients, in one of which the transfusion was done by the citrate method.

The results of transfusion in the series reported are as follows: Life saving, 22; immediately beneficial, but died later from infection or operation, 9; no benefit, 3; harmful, 2.

All of these cases were in a desperate condition and could not have been expected to survive if transfusion had been withheld.

Postoperative Tympanites. J. D. MALCOLM. *Proceedings Royal Society of Medicine, Section of Obstetrics and Gynecology*, 1917, x, 140. (*American Journal of Obstetrics*, February, 1918.)

Malcolm claims that by making a fistula in the cecum or in some other part of the intestine in suitable cases in the couse of an operation, the mortality from abdominal surgery may be reduced by a case here and there, and that patients whose lives may be saved in this way are generally suffering from an intestinal obstruction, brought about by a disturbance of coördination between the muscular activity of the different parts of the alimentary canal, aggravated perhaps by mechanical, physiological, or therapeutic hindrances to the flow of the intestinal contents, the colon being the part in which difficulty most frequently arises. He has made a fistula in twelve cases for the prevention or cure of a postoperative tympanites in a series of 1,000 consecutive operations involving the peritoneal cavity. In 554 cases the disease was in the female pelvic organs, the mortality of these being 252 per cent., and the death rate was 3.8 per cent. for all the cases. This would have been at least 4.2 per cent. if postoperative tympanites had never been treated by making a fistula, for life was certainly saved in four of the cases when the patients were beyond all hope of recovering without this method.

THE LYMPHATIC SYSTEM AND TUBERCULOSIS.

The *American Review of Tuberculosis* for February discusses in its editorial the relationship of the lymphatic system to infection and to hypersensitiveness or relative immunity to tuberculosis. Because of its anatomical relationship the lymphatic system, draining every part of the digestive and respiratory tracts from which practically every tuberculous infection arises, is in itself almost invariably infected either in its vessels or glands. While there is therefore very commonly a deposition of tubercle bacilli in lymph glands there is as yet no good evidence to show that the lymphatic gland or the lymphocyte has a selective or specific antagonistic action on tubercle bacilli. Pigment granules are carried and deposited in the same manner, the difference between the bacilli and granules lying in the fact that the bacilli are alive, able to increase in numbers, and because of their destructive effect upon tissues to be further disseminated through the body. Lack of reactive tubercle formation to bacilli may be found in other tissues beside those of the lymphatic glands. Nor are arrest foci more frequent in lymphatic glands than in the lungs. Intestines, often literally bathed in tubercle bacilli, but remaining uninfected, liver and spleen which rarely show tubercle might be termed immune with equal justice. The only immunity known in tuberculosis, that is, the relative immunity to infection by the tubercle bacillus, is dependent upon a pre-existent focus of infection with the tubercle bacillus. Only such a focus and none of its component parts alone, or tuberculo-protein alone will produce this condition.

Studies in Bone Regeneration. B. BROOKS, St. Louis. (*Annals of Surgery*, December, 1917.)

This experimental study of bone regeneration from bone transplants is based on the use of sodium alizarin sulphonate as a vital stain for new bone. The experimental method was the same in all experiments. Dogs were used as the experimental animals. The operations were all done under complete ether anesthesia. The aseptic precautions were such that infection of the operation wounds did not occur in any instance. A defect in the shaft of the ulna was produced by the excision of 20 to 40 mm. of the bone with its periosteum. The bone transplant or implant was placed in the defect of the ulna. In most experiments the bone transplant or implant was fixed in the medullary canals of the fragments of the resected bone. Living bone transplants were always obtained from the femur. These experiments show conclusively that a defect in the shaft of a bone may be quickly and completely regenerated after placing within the defect an autotransplant of living bone with periosteum and endosteum. There is a question whether the transplanted bone matrix and bone cells retain their viability for a short period of time, but there is no question that the identity of the transplanted bone is ultimately lost as a result of absorption and replacement by new bone. If the periosteum and endosteum together with the adjacent layers of bone are removed from the transplant, it has no osteogenetic properties. If an implant of sterile dry bone is placed in a defect in the shaft of a bone there is no evidence that such an implant aids in any way the regeneration of the defect. The implanted dead bone neither results in a metaplastic production of bone from the surrounding tissue nor does it possess any specific property of conducting bone growth across the defect in the bone shaft. These facts clearly indicate that the living bone transplant with the periosteum and endosteum is the only type of implant which has osteogenetic properties.

An Attempt to Produce Immunity by Transplanting Tuberculous Lymph Nodes Into Normal Animals. G. B. WEBB, C. T. RYDER, and G. B. GILBERT, Colorado Springs. (*American Review of Tuberculosis*, February, 1918.)

Lymph nodes infected with tubercle bacilli were transplanted into normal animals in the hope of conferring immunity. Regional nodes infected from the point of inoculation were transplanted into normal guinea pigs. This acted in the same way as an ordinary inoculation with free bacilli, no increased capacity for resistance, no modification in virulence of the bacilli and no development of the tuberculin reactions before the development of enlarged nodes in the groin of the host were observed. The ulcer over the first implanted node never heals while ulcers over subsequently implanted nodes ulcerate, discharge caseous pus and heal in a very

short time. The lymph node method of inoculation does not appear to differ essentially from the method with free bacilli. The vicarious lesion does not function as a previous infection and confer the partial immunity which would lead to its own healing.

Autogenous replanting was also tried. A pig was infacted by implanting a tuberculous node in the abdominal wall. Six weeks later the inguinal glands were removed and one replaced under the skin. The incisions healed promptly and eight weeks after the second operation the pig was killed and the second planted node found to be surrounded by a dense fibrosis not observed in any other guinea pig up to that time. One of the remaining inguinal nodes was planted in a fresh pig. This pig developed inguinal node enlargement slowly (4½ weeks), ulceration occurred in about seven weeks and the ulcer remained small and indolent. At autopsy four months later there was dense fibrosis around the planted node and general tuberculosis of the fibroid type different from the usual caseous process.

In the hope of giving the host the products of activity of living bacilli without exposure to infection, infected nodes coated with celloidin were implanted into a second pig. If the second pig was tuberculous and sensitive to tuberculin the operation was followed by a skin condition exactly corresponding to the tuberculin reaction, showing that there had been diffusion through the celloidin coating.

The Principles of Wound Treatment. WEDERHAKE. *Münchener medicinische Wochenschrift*, November 27, 1917. (*Medical Record*, February 23, 1918.)

Wederhake offers the following advice after having examined many methods of wound treatment, which he gives to the world as quite original. Free use of tincture of tannic acid for preventing injection of wounds; the use of a concentrated watery solution of potassium permanganate for suppurating cutaneous lesions. Injections of turpentine in the gluteal muscles should be resorted to in streptococcic or staphylococcic injections, and no suppuration arises at the point of injection. Open-air treatment of wounds, they being protected only by a layer of gauze. The use of skin grafts or grafts with hernia sacs in order to accelerate the closure of large torpid wounds. In gas abscesses and gas gangrene the parts should be covered with a layer of sugar and naphthalene after suitable incisions have been made.

Nongonorrheal Disease of the Prostate. M. BARRAGAN. *Medicina Ibera*, November, 1917. (*Journal of the American Medical Association*, February 9, 1918.)

Barragan reviews his experiences with 36 cases of inflammatory processes in the prostate resulting from catheter infection or the catheter going astray; 4 cases consecutive to rectal processes; 4 from foreign bodies in the urethra; 8 from processes in kidney or bladder, and 3 as a consequence of a perineal operation. His two fatal cases were in aged men with septicemia. In the diagnosis he emphasizes the importance of the disturbance in defecation, the desires for defecation occurring almost as incessantly as the desires for micturition, and the act causing intense pains. The pain with acute prostatitis is localized mainly in the depths of the perineum and in the anal region, increasing in intensity at the slightest movement of the muscles, and spreading forward and backward to the lumbar and sacral region. The only relief from the pain is when all the muscles of flexion are relaxed, and we generally find the patient curled up in bed when called in the acute phase.

In his 36 cases a retention prostate catheter was used in 20; in 6 cases the high incision gave relief without infection; in 10 it was followed by infection but an abscess developed only in 4 of the cases; the rest healed with retention catheter. He reiterates that catheterization should be attempted only in men accustomed to the use of the catheter, and in cases of acute retention. Under bed rest, with very hot irrigation under slight pressure of the rectum, (45 or 50 C., 113 or 122 F.) every eight hours, sitz baths and light diet, the general phenomena may subside, along with the tumor felt in the rectum. If they persist, the probabilities are that an abscess is forming, and prompt operative relief is called for unless the prostatis is known to be of urethral origin. In this case expectant treatment for a time is advisable as the abscess may rupture into the urethra and the danger be over. The perineal route for the operation is preferable from every point of view except that the incision takes weeks to heal and the patient has to stay in bed. The great objection to the rectal route is the danger of hemorrhage liable from the congestion in the region. Routier and Oraisson have compiled 32 cases of prostate abscess, opened through the rectum by ten different surgeons, with no death or secondary infection. On the other hand, two of Desnos' three patients died, one from septicemia and one from hemorrhage.

The after-care, as for acute prosatitis, should never be neglected, especially if the gland feels hard and the surface irregular, testifying to catarrhal prostatitis. Otherwise the prostate disease may become chronic. Tuberculous lesions in the prostate present much the same symptoms as any other chronic form except that initial and terminal hermaturia is frequent. The perineal or high incisions are preferable for tuberculous processes. Barragan's article was the leading address at the recent meeting—the fourth congress—of the Asociacion Española de Urologia. Others mentioned their experiences, bringing to 97 the number of cases of nongonorrheal prostate mischief. It was emphasized that in the gonorrheal cases ascending infection was the rule, while in the others infection was generally of blood-borne origin.

INTENSIVE MILITARY TRAINING

(*Southern Med. Journal, Jan., 1918.*)

The following resolutions were adopted unanimously at a meeting of committees from all states (except Maine and Delaware), held in the Congress Hotel, Chicago, October 23, 1917:

Whereas, The experience through which the United States is now passing should convince every thoughtful person of the necessity for the universal training of young men, not only for the national defense in case of need, but also to develop the Nation's greatest asset—its young manhood—in physical strength, in mental alertness, and in respect for the obligations of citizenship essential in a democracy; therefore, be it

Resolved, by the State Committees of the Medical Section of the Council of National Defense, That they strongly urge the adoption by our Government at this time of a comprehensive plan of intensive universal military training of young men for a period of at least six months, upon arriving at the age of nineteen years; and that this body also support the movement to secure the introduction into public schools of adequate physical training and instruction;

Resolved, That the members of each state committee immediately take active steps to insure public support for the subject of these resolutions through the newspapers, through public meetings and through the appointment of committees in each county; also that copies of these resolutions be forwarded to the senators and members of Congress in their respective states, with a personal request that favorable action be taken at the coming session of Congress upon a measure following the principle of the Chamberlain bill and to become operative as soon as the Army cantonments are no longer required for the training of the forces in the present war;

Resolved, That each state committee from time to time report to the Medical Section of the Council of National Defense as to the action taken and progress secured in their several states.

It is of interest to note that essentially the same resolution was adopted two days later (October 25, 1917), by the Clinical Congress of Surgeons of North America at their Chicago meeting.